1242

ATT.
METER LAMP GREEN

SERVICE MANUAL

1242

TABLE OF CONTENTS

Section	Title	Page
1.	**TECHNICAL DESCRIPTION**	
1-1.	Technical Specifications	1
1-2.	Detailed Circuit Analysis	1
1-3.	Block Diagram	7
2.	**DISASSEMBLY AND REPLACEMENT PROCEDURES**	
2-1.	Tools Required	8
2-2.	Hardware Identification Guide	8
2-3.	Top Cover And Bottom Plate Removal	8
2-4.	Front Panel Removal	8
2-5.	Rear Panel Removal	9
2-6.	Switch Replacement	9
2-7.	Pilot Lamp Replacement	10
2-8.	Front Subchassis Removal	11
2-9.	Meter Replacement	11
2-10.	Dial Scale Replacement	11
2-11.	Front Glass Replacement	12
2-12.	Dial Cord Stringing	12~13
2-13.	Mechanical Dial Calibration	14
2-14.	Chassis Layout	14
3.	**ALIGNMENT AND ADJUSTMENT PROCEDURES**	
3-1.	Fm I-f Strip Alignment	15
3-2.	Fm Discriminator Alignment	16
3-3.	Muting Adjustment	16
3-4.	Fm Front-end Alignment	17
3-5.	Fm Stereo Separation Adjustment	18
3-6.	A-m I-f Strip Alignment	20~21
3-7.	A-m Frequency Coverage And Tracking Adjustment	22~23
4.	**REPACKING**	24
5.	**DIAGRAMS**	
5-1.	Mounting Diagram Fm Front-end Board	25
5-2.	Mounting Diagram Fm I-f Board	26~27
5-3..	Mounting Diagram A-m Cp/I-f Board	28~29
5-4.	Mounting Diagram MPX Decoder Board	30~31
5-5.	Mounting Diagram Power Supply Board	32
5-6.	Schematic Diagram	33~34
6.	**EXPLODED VIEW**	35~37
7.	**ELECTRICAL PARTS LIST**	38~43

SECTION 1
TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the ST-5100 are given in Table 1.

TABLE 1. SPECIFICATIONS

Fm Tuner Section

Antenna	:	300 Ω balanced, 75 Ω unbalanced
Tuning range	:	87 to 108 MHz
Usable sensitivity	:	2.6 μV IHF
S/N ratio	:	70 dB
Capture ratio	:	1.5 dB
Selectivity	:	80 dB IHF
Image rejection	:	75 dB
I-f rejection	:	90 dB
Spurious rejection	:	100 dB
A-m suppression	:	50 dB IHF
Harmonic distortion	:	Mono: 0.2% at 400 Hz, 100% mod. Stereo: 0.5% at 400 Hz, 100% mod.
Fm stereo separation	:	Greater than 40 dB at 400 Hz
19 kHz, 38 kHz suppression	:	60 dB

A-m Tuner Section

Antenna	:	Built-in ferrite-bar antenna with external antenna provision
Tuning range	:	530 kHz to 1605 kHz
Intermediate frequency	:	455 kHz
Sensitivity	:	48 dB/m, built in antenna 20 μV, external antenna
S/N ratio	:	50 dB
Image rejection	:	60 dB at 1000 kHz
I-f rejection	:	46 dB at 1000 kHz
Harmonic distortion	:	0.8 %

Audio Output		
FIX	:	750 mV 10 k ohms
VARIABLE	:	0 to 2 V 1 k ohm

General

Power requirements	:	100, 117, 220, 240 V AC 50/60 Hz
Power consumption	:	Approx 13 watts
Dimensions	:	422mm (width) X 148mm (height) X 340mm (depth) 16 5/8" (width) X 5 13/16" (height) X 13 3/8" (depth)
Net weight	:	7.2 kg (15 lb 14 oz)
Shipping weight	:	11.3 kg (24 lb 12 oz)

Design and specifications are subject to change without notice.

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the operation or functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at the left margin; major components are also listed in a similar manner.
Refer to the block diagram on page 7 and the schematic diagram on pages 33 to 34.

Stage/Control	*Function*
FM Front End	
Balun B1	This transformer matches 300-ohm twin lead to the fm front-end's input stage and thereby couples the received signal to the front-end.
Passive rf circuit L101, L102, L103	A triple-tuned circuit is employed between the antenna and mixer transistor. This passive coupling circuit contains no active amplifiers, so it is perfectly linear and cannot produce distortion and overload components. Thus, the factors that contribute to spurious responses are eliminated ahead of the mixer.
Local oscillator Q102	Supplies heterodyning voltage to the mixer via L104. The circuit is a modified Hartley type with feedback applied to the emitter from the tap on L104.

Stage/Control	*Function*
AFC circuit D101, D102	An automatic frequency control circuit is incorporated in the oscillator circuit to eliminate frequency drift and the difficulty of exact tuning. The principle of afc operation is as follows: When the tuner is correctly tuned, the intermediate frequency is 10.7 MHz and no dc correction voltage is produced by the ratio detector as shown in the "S" curve response of Fig. 1-1. So the voltage applied to diode D101 is determined solely by the positive fixed reverse bias voltage supplied by zener diode D102. Now, assume that the local oscillator frequency changes by +△f. This means that the new intermediate frequency is 10.7 MHz +△f. See Fig. 1-1. As the result a positive dc component is fed back to the anode of D101, decreasing the reverse voltage to it, and making D101's barrier capacitance increase. This decreases the local oscillator's frequency, since the series circuit composed of C120 and D101 is connected in parallel with the tank circuit of the local oscillator. Conversely, if the local oscillator frequency decreases a negative dc voltage is fed back to D101 increasing the local oscillator frequency.
Mixer Q101	Rf signals and local oscillator voltages are heterodyned in the gate-source junction of mixer Q101 to produce 10.7 MHz i-f output signal.
IFT 101	Transformer IFT 101 and capacitors C106 and C107 form a 10.7 MHz "high-C" tuned circuit. This type of circuit has the advantage of reducing the higher order harmonics of 10.7 MHz which cause cross modulation or spurious interference.
I-f preamplifier Q103	The i-f signal coupled to the base of if preamplifier Q103 by the secondary winding of IFT 101 is amplified to achieve a favorable signal-to-noise ratio before application to the filters in the i-f strip.

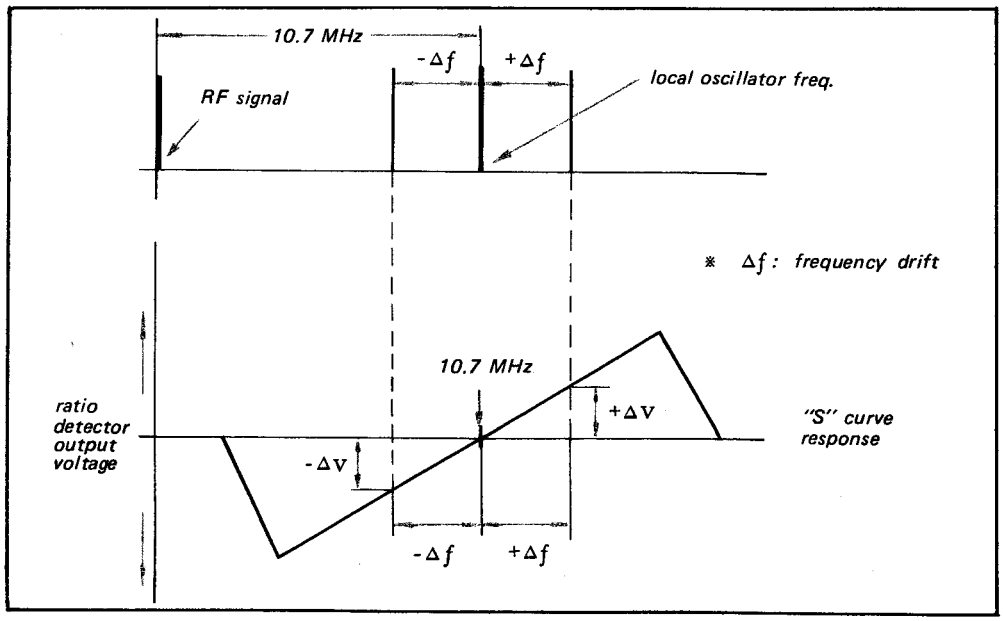
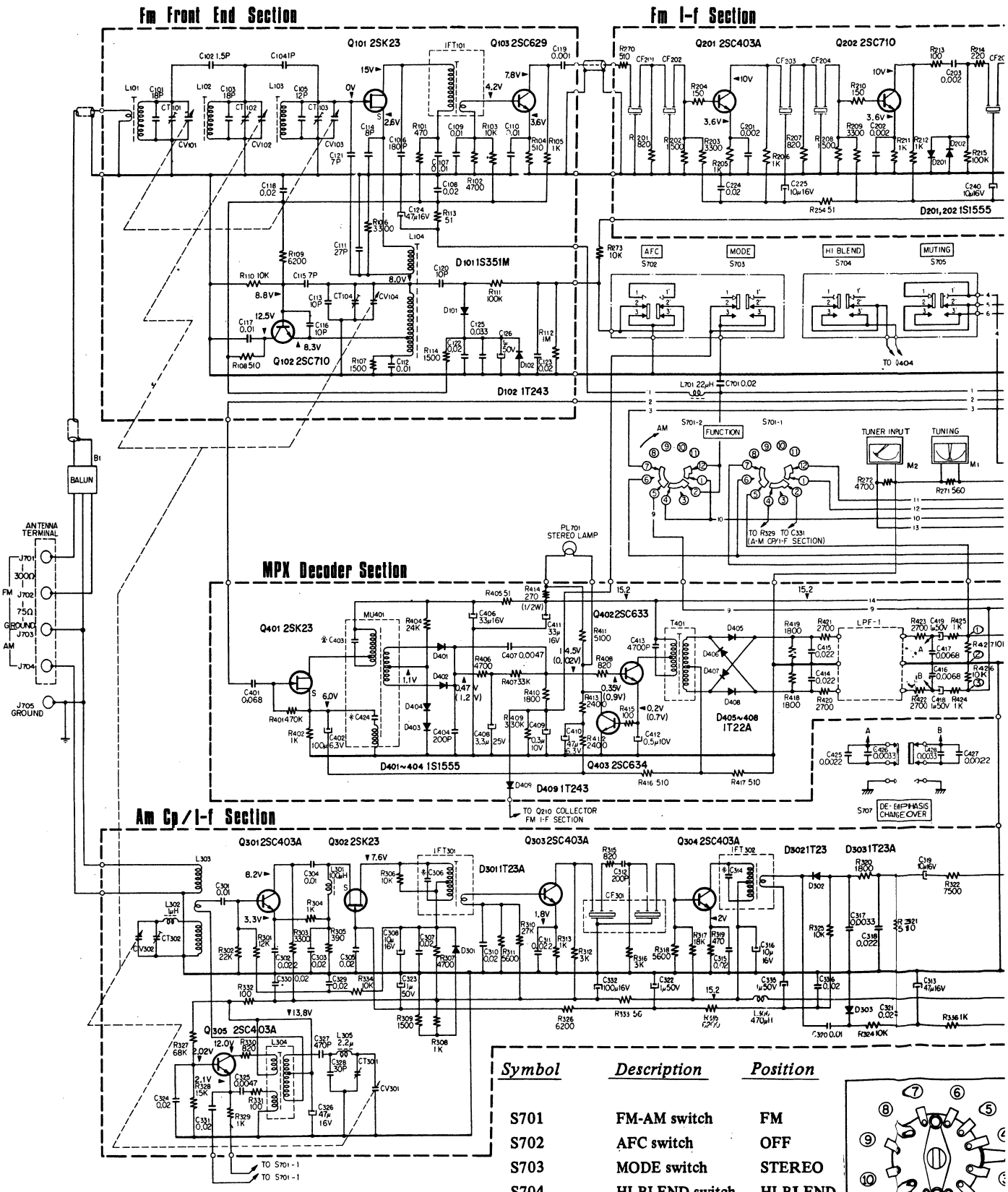
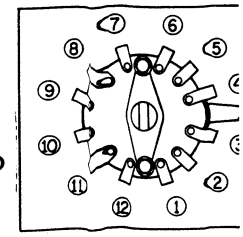


Fig. 1-1 Local oscillator's frequency drift and afc voltage relationship

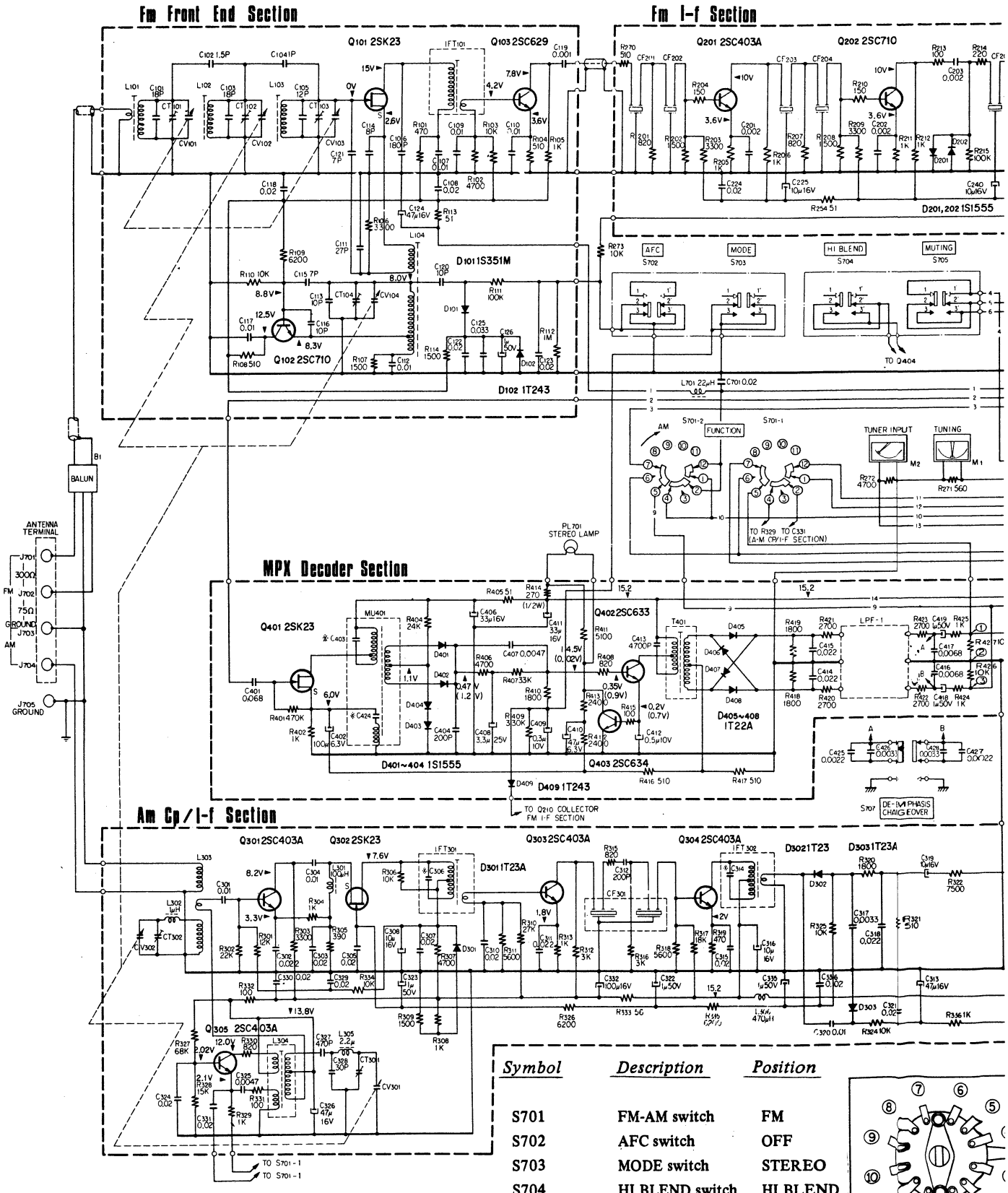
SCHEMATIC DIAGRAM



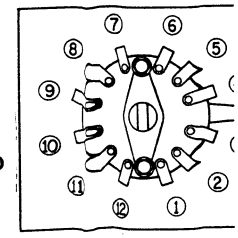
Symbol	*Description*	*Position*
S701	FM-AM switch	FM
S702	AFC switch	OFF
S703	MODE switch	STEREO
S704	HI BLEND switch	HI BLEND
S705	MUTING switch	ON
S706	POWER switch	OFF
S707	De-emphasis switch	75 μ sec

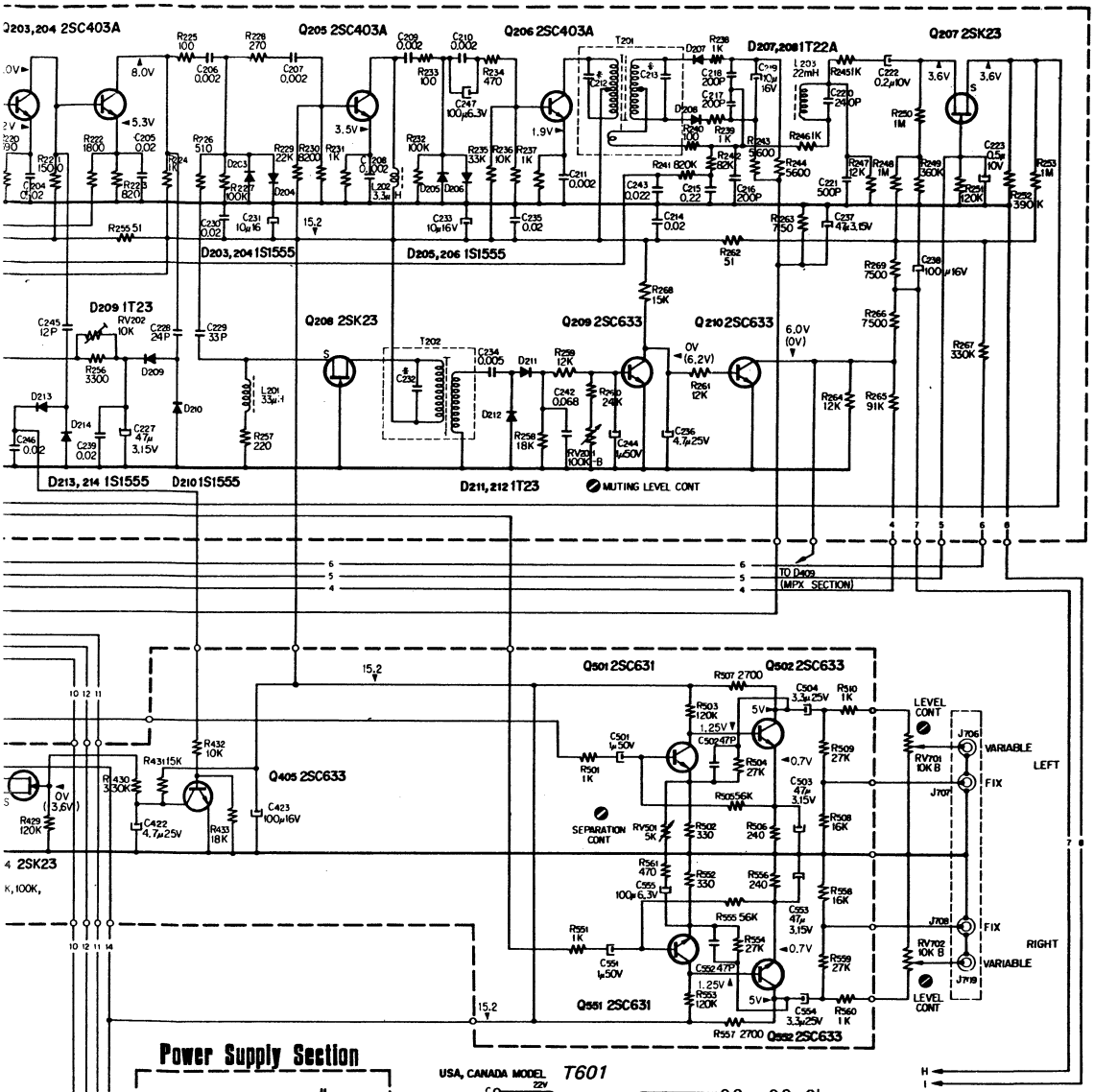


SCHEMATIC DIAGRAM



Symbol	*Description*	*Position*
S701	FM-AM switch	FM
S702	AFC switch	OFF
S703	MODE switch	STEREO
S704	HI BLEND switch	HI BLEND
S705	MUTING switch	ON
S706	POWER switch	OFF
S707	De-emphasis switch	75 μ sec

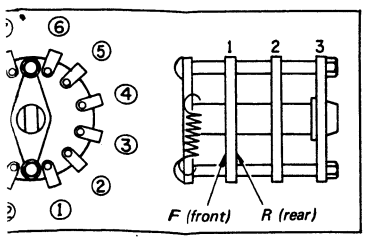


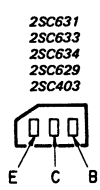


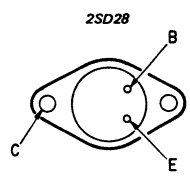
SONY®
ST-5100

© 1970

SWITCH INDEX







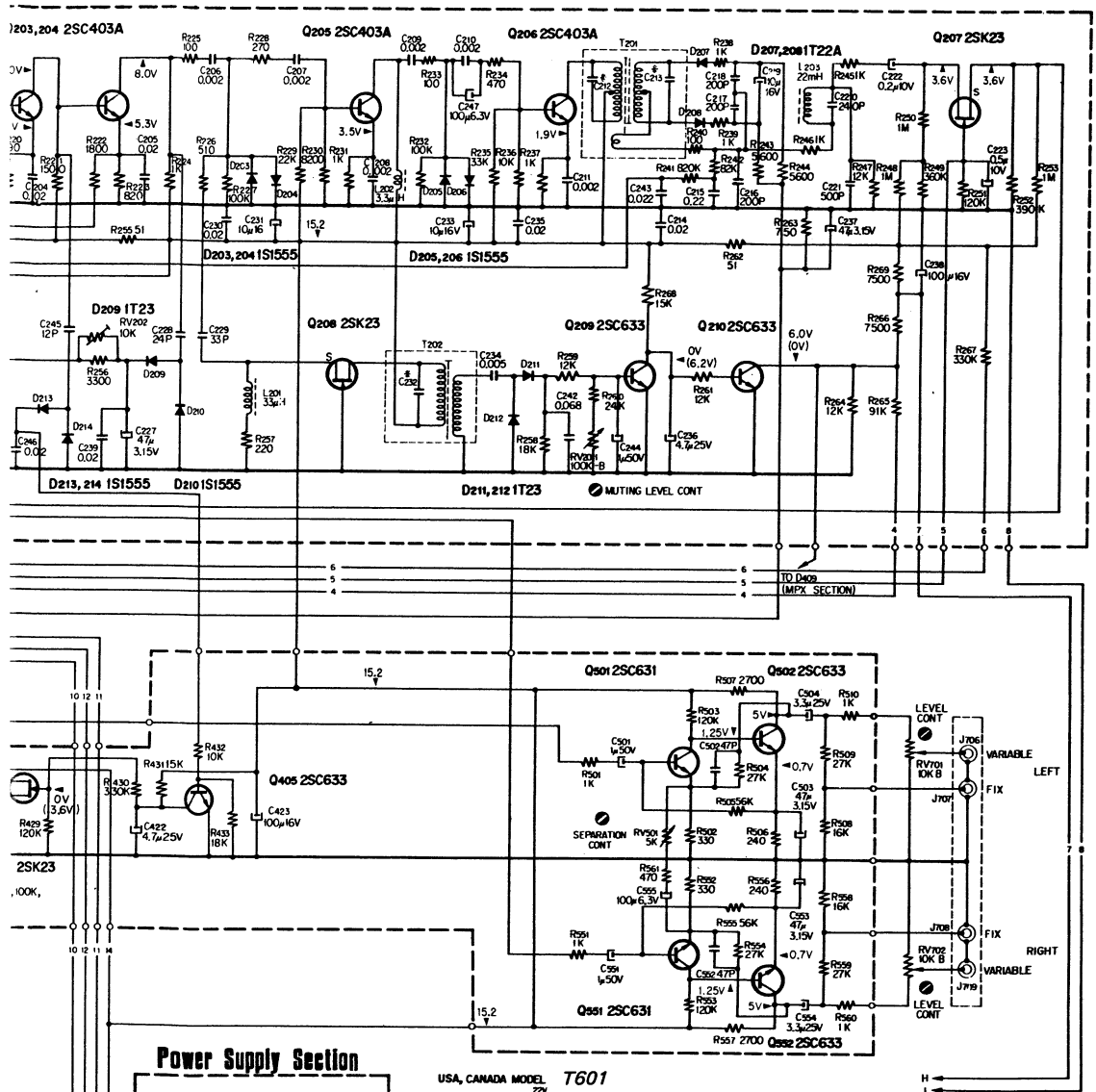
Note:

All resistance values are in ohms. k=1000, M=1000 k

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ± 20%.

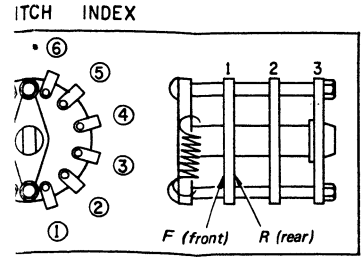
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in. [ ] signal voltages are measured with ac VTVM and expressed in dBm refered to 0.775 volts, 1 kHz.

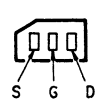


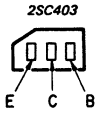
SONY®
ST-5100

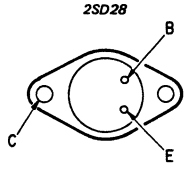
© 1970

ITCH INDEX









Note:

All resistance values are in ohms. k=1000, M=1000 k

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ± 20%.

All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in. [------] signal voltages are measured with ac VTVM and expressed in dBm refered to 0.775 volts, 1 kHz.

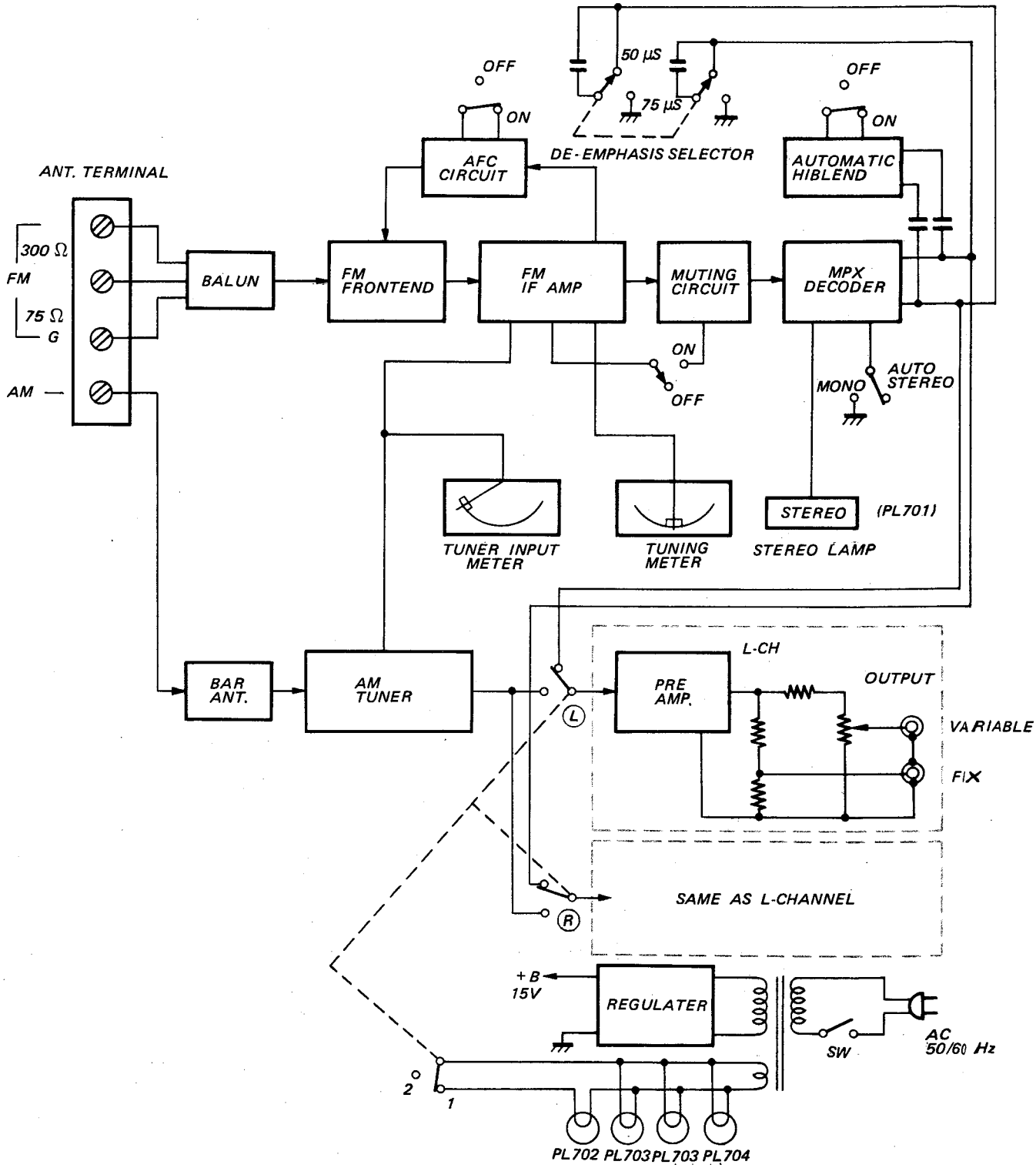
Stage/Control	*Function*
Fm I-f Amplifier	
I-f amplifiers Q201 to Q206 CF201 to CF206	These i-f stages are basically RC ccupled amplifiers that provide an essentially flat frequency response. The selectivity of this section is determined by three pairs of ceramic filters (CF201 to CF206) in the interstage-coupling path. These filters operate in a "trapped-energy" mod. The filters provide extremely sharp skirt selectivity and flat response inside the passband. Thus, these filters determine overall tuner selectivity.
Diode limiters D201 to D206	Limiting is accomplished by diode pairs, connected in parallel and poled in opposite directions. The diodes conduct when the signal across them exceeds the barrier potential of about 0.6 volts in the forward direction. Thus, the signal is limited in both directions to 1.2 volts peak-to-peak. The diodes provide symmetrical limiting.
Q206	Signal at the base of Q206 has had all amplitude variations removed by the preceding limiters and only selected signals have been passed by the ceramic filters. Q206 provides power to driver the ratio detector.
Muting circuit Q207 to Q210 D211, D212 S705 T202	The i-f signal is extracted from limiter diodes D203 and D204 to drive the muting circuit. The extracted i-f signal is amplified by Q208 enough to drive voltage doubler D211 and D212 through tuned transformer T202. T202 determines band width (about ±150 kHz) necessary to control muting circuit without generate interstation or detuning noise. The output of the voltage doubler is a positive dc voltage proportional to carrier levels of weak rf signals. Q209 and Q210 form a switching circuit which is driven by the voltage doubler. Q209 is normally cutoff, thus forcing Q210 into conduction. The collector of Q210 is connected to the gate of FET Q207 through MUTING switch S705. FET Q207 acts as an electronic switch which is inserted between the ratio detector and MPX decoder, and is controlled by the gate voltage applied. With the MUTING switch ON, fm signals of average strength keep Q209 saturated, thus cutting off Q210. This causes Q207 to conduct and maintain normal operation. Weak stations and interstation noise can not produce sufficient dc voltage at the base of Q209 to keep it conducting. As a result, Q209 is cutoff. This saturates Q210 and cuts off Q207, accordingly, the audio output is muted. With the MUTING switch OFF. Q207 is kept conducting regardless of the strength of the fm signal by a positive bias voltage on its gate. Rv201 adjusts the muting level.
Stereo-mono automatic switching circuit D409, Q210	The collector of Q210 is also connected to the output terminal of the MPX decoder's frequency doubler through diode D409. This prevents noisey stereo reception by automatically switching the MPX decoder's operation into the monaural mode. This is because in fm stereo broadcasting, the S/N ratio of a demodulated stereo signal worsens much more rapidly than that of a mono signal when the input signal strength decreases. As Q210 is forced into conduction by weak stations, the frequency doubler's output is effectively

Stage/Control	*Function*
	grounded, stopping the operation of the stereo demodulator. Thus, automatic switching of stereo to mono according to the input rf signal level is achieved.
TUNER INPUT meter M2, D209, D210	I-f signal from the collector of Q204 is coupled through C228 to a rectifier-doubler consisting of diodes D209 and D210. At this point in the circuit, the i-f signal is proportional to the r-f signal strength for all but very -strong input signals. Therefore, the filtered dc output voltage of the rectifier-doubler is proportional to the r-f signal strength, and is used to drive TUNER INPUT meter M2.
SCA trap L203, C220	The composite signal containing monaural information from 0 to 15 kHz, the 19 kHz pilot carrier, and the fm stereo signal at 38 kHz is fed to Q207 through trap L203-C220. This trap removes the unwanted SCA signals to feed a clean composite signal to the base of Q401 (the 19 kHz amplifier) through Q207.
MPX Decoder	
19 kHz amplifier Q401	This stage serves two functions. It extracts the 19 kHz pilot signal by means of a tuned circuit at its drain, and provides a low -impedance source of composite stereo signal (without pilot carrier) at its source. By using an FET, harmonics of the 19 kHz and 38 kHz components are reduced to a low level, thereby causing less carrier leak or beat interferance.
Frequency doubler D401, D402	Signals developed at the collector of Q401 are transformer coupled to a full wave rectifier consisting of D401 and D402. The output of this rectifier is not filtered, resulting in two positive pulses for each input cycle. Thus, the 19 kHz pilot-carrier frequency is effectively doubled by D401 and D402. However, the waveform is not sinusoidal at the base of Q402.
38 kHz amplifier Q402	The 38 kHz pulses produced by D401 and D402 are amplified by Q402. The tank circuit at the collector of Q402 is tuned to 38 kHz to restore these pulses to a sinusoidal waveform. This signal is transformer coupled to the bridge-type demodulator to supply sampling drive for the demodulator.
STEREO lamp circuit Q403	The STEREO indicator lights only when the MODE switch is set to STEREO and an fm stereo signal is received by means of stereo-mono switching circuit. The emitter of Q402 is connected to the base of Q403 which is normally cut off. The circuit operates as follows: When a composite stereo signal is applied to the multiplex decoder, the 38 kHz pulses produced at the output of the frequency doubler yield a higher average current flow through Q402. This forces Q403 into conduction, lighting STEREO indicator lamp PL701.
Multiplex demodulator D405, D406 D407, D408	The demodulator circuit employs four diodes in a balanced-bridge arrangement. This system has the advantage of cancelling residual rf components (38 kHz signal, and higher-order harmonics of these frequencies.) "L" and "R" components are developed at each side of the bridge as the result of demodulation, when the receiver is operated in the stereo mode. In the monaural mode, diodes D405

Stage/Control	*Function*
	and D408 are forward biased by supply voltage through R414, the stereo indicator lamp, R413, R412 and R416, so these diodes merely act as small resistances. Under this condition, the monaural signal is applied to both "L" and "R" audio amplifiers.
LPF-1	Filters out the unwanted higher -order harmonics of 19 kHz and 38 kHz leakage to obtain clear audio.
De-emphasis capacitors C416, C417, C425, C426, C427, C428	These capacitors provide the roll-off at high audio frequencies necessary to compensate for pre-emphasis at the transmitter. S707 should be set to the proper time constant.
De-emphasis switch S707	Specified de-emphasis time constant is 75 micro-seconds in the USA and CANADA, and 50 micro-seconds in Europe.
Automatic high-blend circuit D213, D214 Q404, Q405	This circuit is employed to automatically remove from the multiplex decoder output the hiss or noise caused by weak stereo signals. This noise reduction is achieved in the multiplex decoder with only a slight reduction in high-frequency response by mixing the oppositely -phased noise components of the left and right channels. With the HIGH BLEND switch set to AUTO, FET Q404 acts as a noise mixer and operates as follows. The i-f signal from the collector of Q203 is rectified by a voltage doubler consisting of diodes D213 and D214. Its dc output is supplied to transistor Q405 which controls the gate voltage of Q404. As a result, fm input signal strength determines Q404's operating condition (the amount of mixing), because the fm i-f signal at Q203 is exactly proportional to the input signal strength. Under no signal or weak signal conditions, Q405 is cut off without being forward biased. This produces a positive bias voltage at the gate of Q404, enabling the mixing of noise from each channel. The mixing level and noise frequency are determined by capacitors C420 and C421, and the impedance between the source and drain of Q404. When the stereo signal is strong enough to provide relatively noise-free listening, Q405 conducts and cuts off Q404. This stops the noise blending operation. When the HIGH BLEND switch is set to the HIGH BLEND, Q404's drain and source are shorted together, thereby providing maximum blending regardless of signal conditions.
A-m Tuner	
Local oscillator Q305	This stage supplies injection voltage to the mixer via L303. In this oscillator circuit the feedback is applied to the emitter of Q305 from a low-impedance winding on oscillator coil L304.
Mixer Q301	Incoming rf signals and local-oscillator voltage are heterodyned in the base-emitter junction of Q301 to produce the 455-kHz output. IFT 301 is a transformer tuned for 455 kHz. It develops the i-f signal, and provides a path to ground through bypass capacitor C307 for the other heterodyne products. The low-impedance output winding of IFT 301 provides link coupling to i-f amplifier Q303.

Stage/Control	*Function*
I-f amplifier Q303 Ceramic-filter CF301	This stage is basically an RC-coupled amplifier. The selectivity of the stage is determined by a double ceramic filter (CF301) in the interstage-coupling path. This filter provides extremely sharp skirt selectivity inside the pass-band.
I-f amplifier Q304	This circuit provides the power to drive diode detector D302.
Detector D302	The i-f signal from the secondary of IFT302 is rectified by diode D302. The i-f components of the output signal are filtered by C317, C318, and R320. The output appearing across R321 is therefore clean audio.
Agc circuit Q302	The negative dc component at the anode of diode D302 is filtered by C335, C336, C322, C323, R326, and R335, and fed back to the gate of Q302 to control its gain. The time constants of the agc filter components remove audio variations from the agc voltage.
TUNER INPUT meter M2, D303	I-f signal from the secondary winding of IFT302 is coupled through capacitor C320 to diode rectifier D303. The i-f output at the detector varies according to signal strength (it is not directly proportional due to AGC action), so the rectified and filtered i-f signal is used to drive the TUNER INPUT meter to indicate relative signal strength and facilitate a-m tuning.
Audio Stages	
Audio preamplifier Q501, Q502 (Q551, Q552)	Demodulated L and R signals are amplified by these stages to obtain the specified audio output levels.
Separation control Rv501	The network that connects the emitters of Q501 and Q551 provides a form of negative feedback between left and right channels. Any residual L signal in the R channel (which is about 180° out of phase) is cancelled out by the "L" signal from the L channel. The same is true of residual R signal in the L channel. Rv501 is therefore set for maximum channel separation.
Output terminals J706, J707, (J708, J709)	The audio signal from the pre-amplifier is fed through Rv701 (10 k) to the VARIABLE output jack, and through R509 (27 k) to the FIX output jack. These resistors determine the output signal level. The specified output level at the FIX jack is 750mV, while that at the VARIABLE jack can be changed from 0 to 2 V.
Power Supply	
Rectifier circuit T601, D603	Line input is supplied to transformer T601 through POWER switch S705. The output from T601 is rectified by full-wave rectifier D603 to produce +28 volts dc.
Voltage regulator Q601, D601, D602	Dc output from the rectifiers is filtered by C603 and applied to series regulator Q601. Since the voltage at the base of Q601 is kept constant by means of zener diodes D601 and D602, the emitter voltage remains constant regardless of load or line-voltage variations. Moreover, since the base of Q601 is supplied with well filtered dc (due to C601 and C602), the ripple at the emitter of Q601 is negligible and the output impedance is very low.

1-3. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools are required to perform disassembly and replacement procedures on the ST-5100.

Screwdriver, Phillips-head
Screwdriver, 1/8″ blade (3mm)
Pliers, long-nose
Diagonal cutters
Nutdriver, 3mm (1/8″)
Tweezers
Soldering iron, 40-150 watts
Cement solvent
Tape, electrical
Cement, contact
Solder, rosin core
Tape, double-coated

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in this service manual.

Note: All screws in the ST-5100 are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable because ISO screws have a different number of threads per mm compared to the old ones.
The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

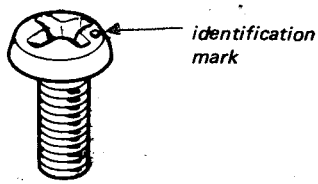
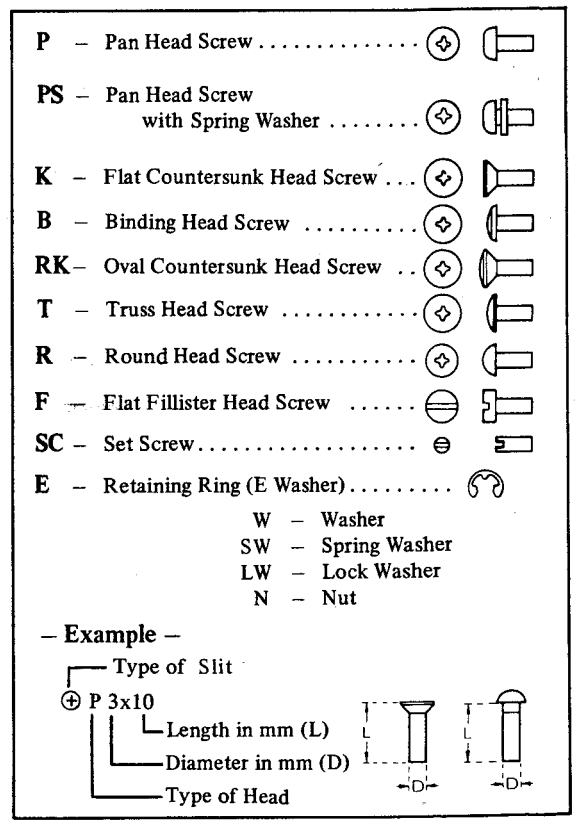


Fig. 2-1. ISO screw

— Hardware Nomenclature —


P – Pan Head Screw
PS – Pan Head Screw with Spring Washer
K – Flat Countersunk Head Screw
B – Binding Head Screw
RK – Oval Countersunk Head Screw
T – Truss Head Screw
R – Round Head Screw
F – Flat Fillister Head Screw
SC – Set Screw
E – Retaining Ring (E Washer)
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut
– Example –
Type of Slit
P 3x10
Length in mm (L)
Diameter in mm (D)
Type of Head
L
D

2-3. TOP COVER AND BOTTOM PLATE REMOVAL

1. Remove the two machine screws at each side of the tuner, and lift off the top cover.

2. Remove the six screws (+PS 3 X 6) at the bottom of the tuner and pull the bottom plate in the direction indicated by the arrow in Fig. 2-2.

2-4. FRONT PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.

2. Remove the POWER switch and FM-AM switch levers by unscrewing them counterclockwise.

3. Remove the three screws (+PS 4 X 6) behind the top edge of the front subchassis assembly. See Fig. 2-3.

4. Turn the tuner over and remove the two screws (+PS 3 X 6) at the front bottom edge of the chassis as shown in Fig. 2-4.
   This frees the front panel.

2-5. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.

2. Remove the two screws (+PS 3 X 6) at each side of the rear panel and one screw (+B 3 X 4) as shown in Fig. 2-5.
   This frees the rear panel.

2-6. SWITCH REPLACEMENT

Preparation: Remove the front panel as described in Procedure 2-4.

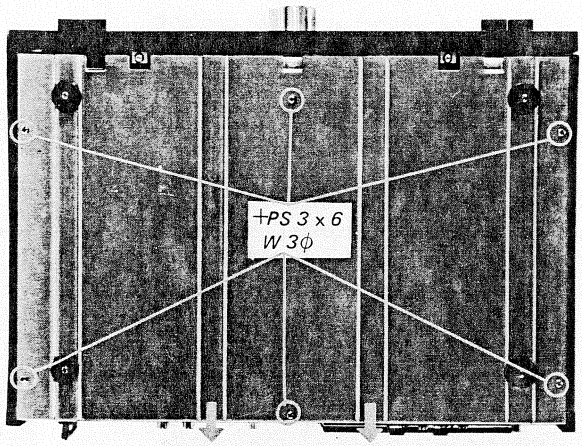


Fig 2-2 Bottom plate removal

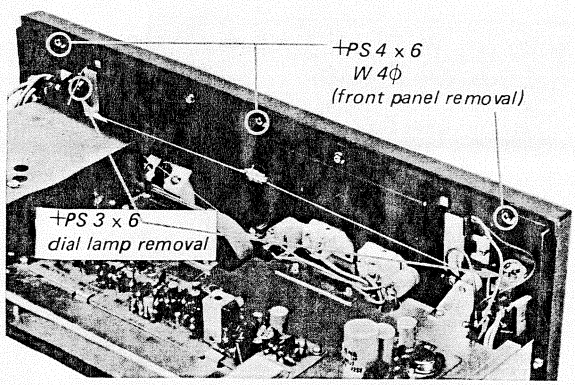


Fig. 2-3 Front panel removal (1)

POWER and FM-AM Switches

1. Unsolder the leads and encapsulated components from the switch lugs, then solder them to a new switch.

2. Remove the two screws (+PS 3 X 6) securing the switch to the front subchassis. See Fig. 2-6.

3. Install the new switch.

MUTING, HI BLEND, AFC and MODE Switches

1. Pull off the switch button.

2. Remove the two screws (+PS 3 X 6) securing the switch mounting circuit board to the subchassis as shown in Fig. 2-6.

3. Remove the defective switch and then install the replacement switch.

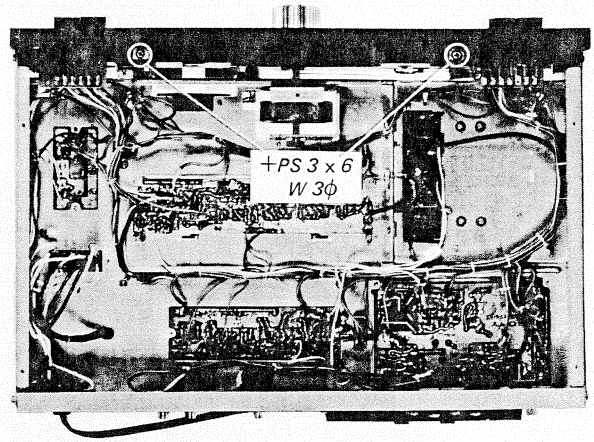


Fig. 2-4 Front panel removal (2)

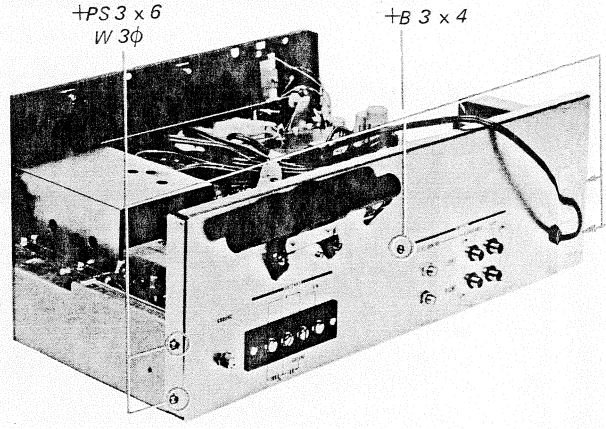


Fig. 2-5 Rear panel removal

2-7. PILOT LAMP REPLACEMENT

Preparation:

Remove the front panel as described in Procedure 2-4.

Dial Lamp

1. Remove the screw (+PS 3 X 6) securing the dial lamp socket to the front subchassis. See Fig. 2-7.
2. Pull the defective lamp from the socket with tweezers or long-nose pliers.
3. Install a new lamp.

Meter Lamp

1. Straighten the tab of the meter-lamp holder to permit the removal of the meter-lamp socket; then pull out the meter-lamp socket.
2. Unscrew the lamp from the socket and install a new one.

STEREO Lampe

1. Pull the lamp from its holder with tweezers.
2. Cut the lamp leads in the middle and solder the lead wires to a new lamp as shown in Fig. 2-8.
3. Wrap the soldered connections with electrical tape.
4. Install the new lamp in its holder.

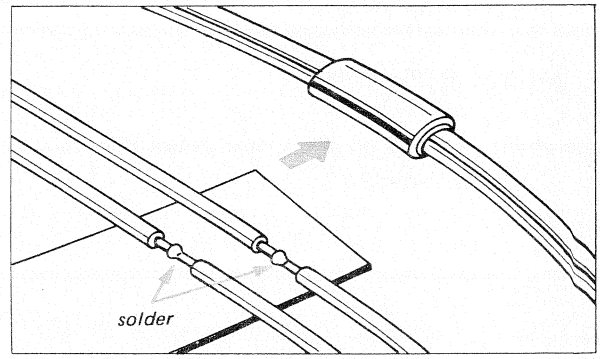


Fig. 2-8 Stereo lamp replacement

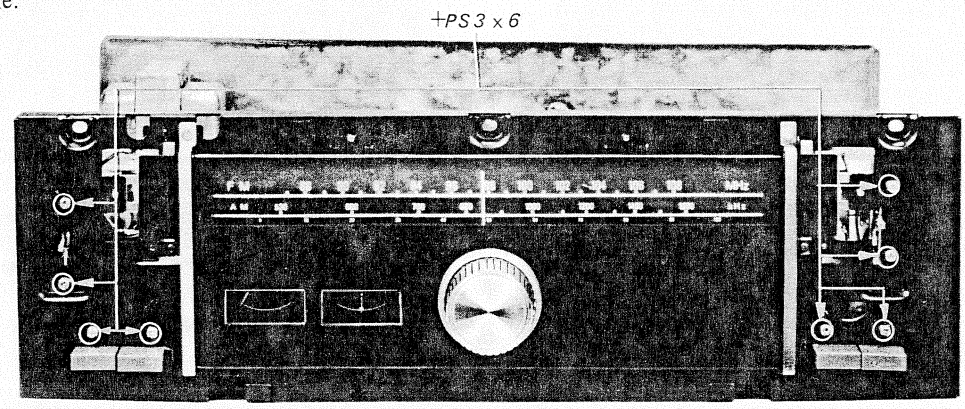


Fig. 2-6 Switch replacement

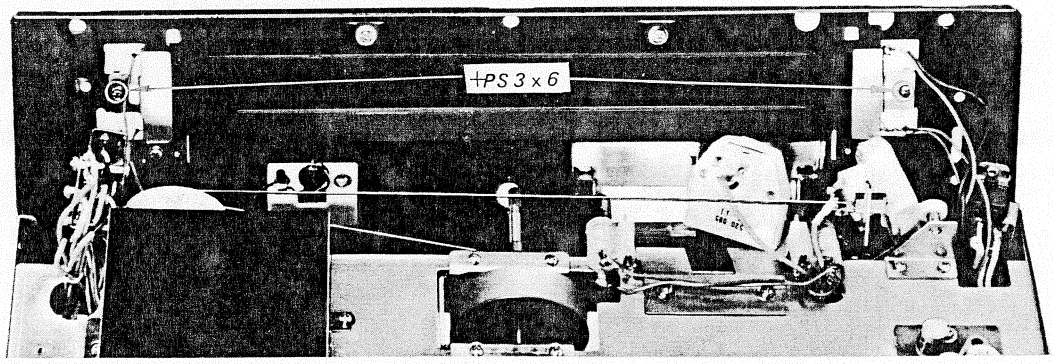


Fig. 2-7 Dial lamp removal

2-8. FRONT SUBCHASSIS

The front subchassis is a vertical member to which the dial glass, tuning meter, pilot lamps, and switches are attached.

1. Remove the front panel. POWER switch, FM-AM switch, and dial-lamp sockets as described in Procedures 2-4, 2-6 and 2-7.
2. Remove the two screws (+PS 3 X 6) at each side of the subchassis as shown in Fig. 2-9.
3. Unhook the dial pointer from the subchassis. Now the front subchassis can be tilted forward and down. See Fig. 2-10.

2-9. METER REPLACEMENT

1. Remove the front subchassis as described in Procedure 2-8.
2. Unsolder the leads from the defective meter.
3. Gently pry out the meter with a screw driver.
4. Apply double-coated tape to the new meter, and then install the replacement meter.

2-10. DIAL SCALE REPLACEMENT

1. Remove the front subchassis as described in Procedure 2-8.
2. Remove the four screws (+PS 3 X 6) behind the front subchassis. See Fig. 2-11.

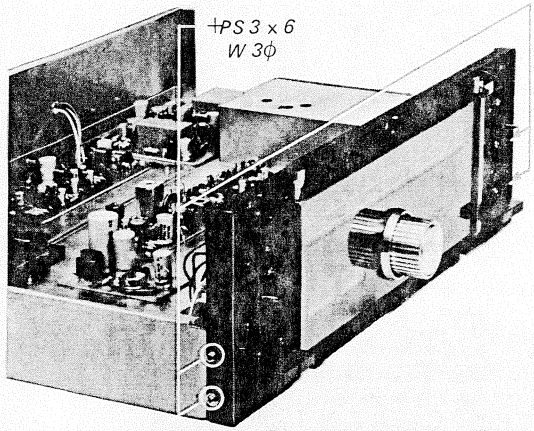


Fig. 2-9 Front subchassis removal (1)

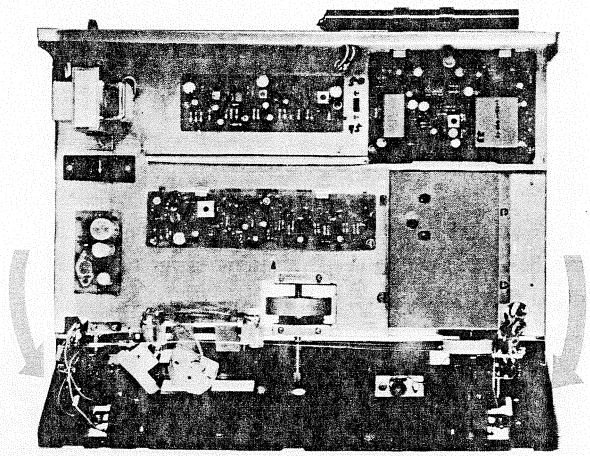


Fig. 2-10 Front subchassis removal (2)

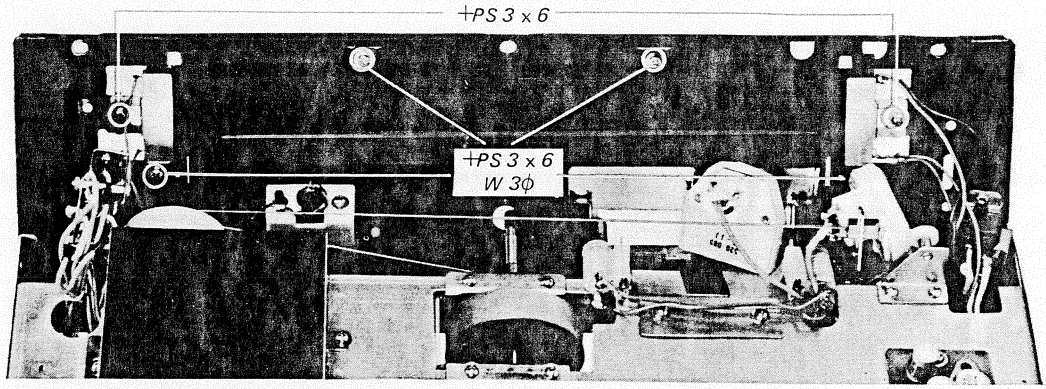


Fig. 2-11 Dial scale removal (1)

3. Now the dial scale can be removed with the back plate as shown in Fig. 2-12.

4. Remove the two screws (+P 2.6 X 4) securing the dial-scale holder to the back plate. See Fig. 2-12.

5. Remove the defective scale and then install a new one.

2-11. FRONT GLASS REPLACEMENT

1. Remove the front panel as described in Procedure 2-4.

2. Pull off the tuning knob, then remove the ornamental ring by loosening the two screws (+P 2.6 X 4). See Fig. 2-13.

3. Remove the two screws (+K 2.6 X 4) securing the front-glass holder to the subchassis. See Fig. 2-13.

4. Remove the front glass and then install the new one.

2-12. DIAL CORD STRINGING

Two dial cords are employed in the dial drive mechanism. One drives the tuning capacitor, and the other drivers the dial pointer.

Tuning-Capacitor Drive-Cord Stringing

Preparation:

1. Remove the front subchassis as described in Procedure 2-8.

2. Remove the washer from the tuning capacitor shaft by loosening the screw (+P 2.6 X 4) as shown in Fig. 2-14.

Procedure

1. Rotate the tuning-capacitor drive drum fully clockwise.

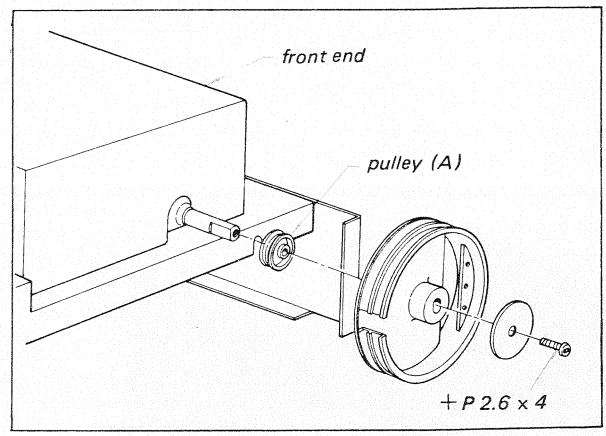


Fig. 2-14 Tuning-capacitor drive drum installation

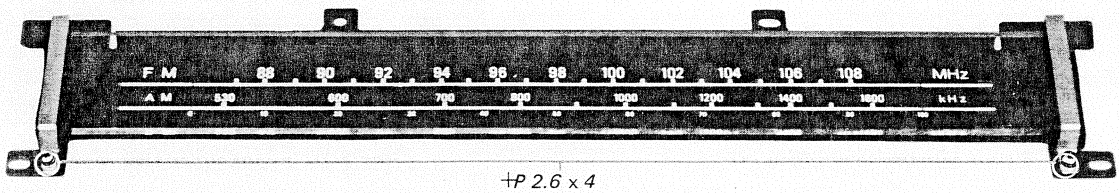


Fig. 2-12 Dial scale removal (2)

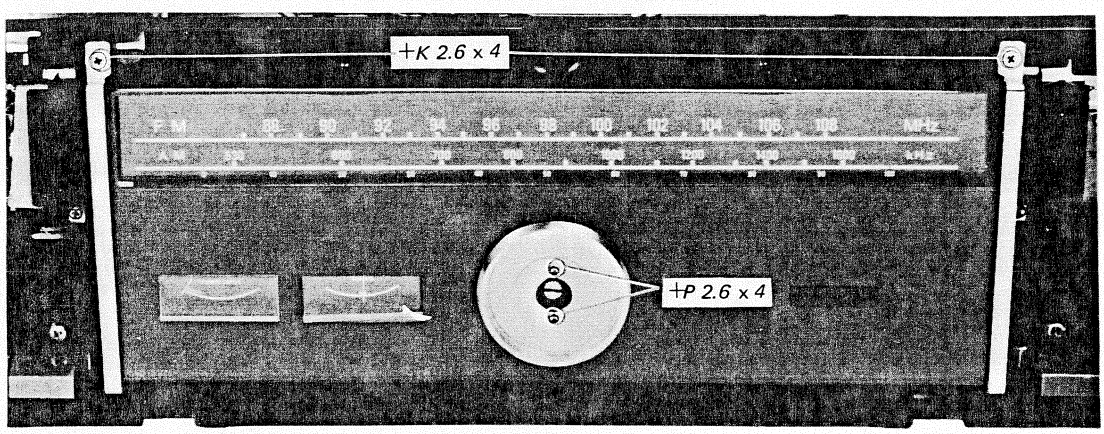


Fig. 2-13 Front glass replacement

2. Tie one end of the replacement dial cord (0.5 mm or 1/32" diameter) to a coil spring, and then hook the spring to one hole of the drive drum as shown in Fig. 2-15.

3. Follow the stringing diagram as shown in Fig. 2-16. Note that the dial cord should run through the inner groove of the drive drum.

4. At the finish, tighten the cord, then squeeze the eyelet so that the spring is under tension. See Fig. 2-17. Make a knot in the cord end to keep it from slipping out of the eyelet.

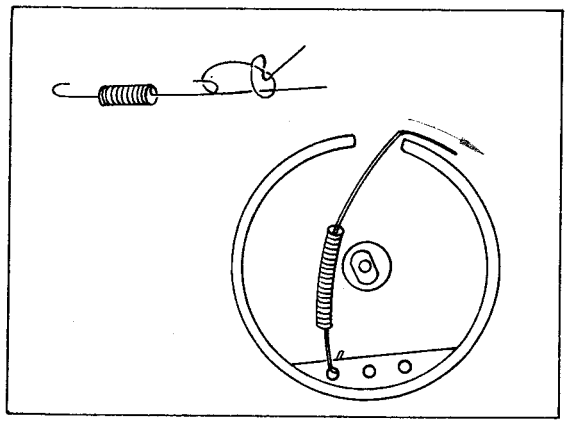


Fig. 2-15 Starting point detail

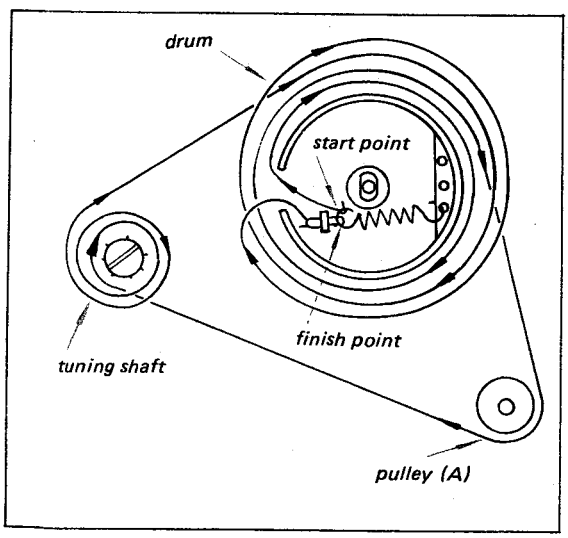


Fig. 2-16 Tuning-capacitor drive cord stringing

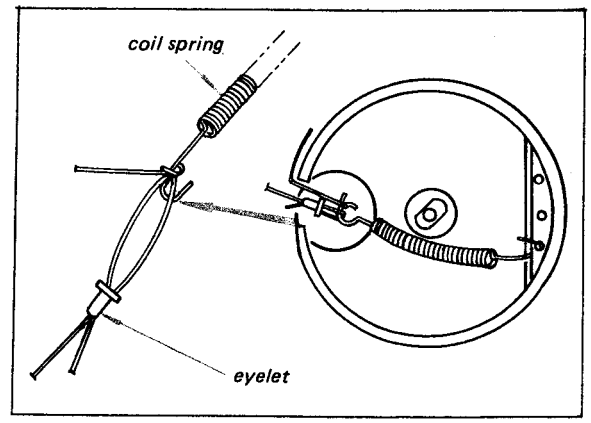


Fig. 2-17 Finish point detail

Dial-Pointer Driver-Cord Stringing

Preparation

1. Remove the front subchassis as described in Procedure 2-8.

2. Remove the washer from the tuning capacitor shaft by loosening the screw (+P 2.6 X 4) as shown in Fig. 2-14.

Procedure

1. Rotate the tuning-capacitor drive drum fully clockwise.

2. Tie one end of the replacement dial cord (0.5 mm or 1/32" diameter) to a coil spring, and then hook the spring to one hole of the drive drum as shown in Fig. 2-19.

3. Follow the stringing diagram as shown in Fig. 2-19.
   Note that the cord should run through the outer groove of the drive drum.

4. At the finish, tighten the cord, then squeeze the eyelet so that the spring is under tension. See Fig. 2-17. Make a knot in the cord end to keep it from slipping out of the eyelet.

5. Put the dial pointer on the cord as shown in Fig. 2-18.

6. After completing the dial-cord stringing, make sure the tuning system works properly.

7. Reassemble the front subchassis, and then follow the mechanical dial calibration.

2-13. MECHANICAL DIAL CALIBRATION

Note: This is required after replacing the dial scale, dial drum, or tuning capacitor.

1. Put the dial pointer on the cord as shown in Fig. 2-18 and move it to a position indicating "0" reading on the dial scale when the tuning capacitor is set to maximum capacitance.

2. Apply a drop of contact cement to the tab of the dial pointer.

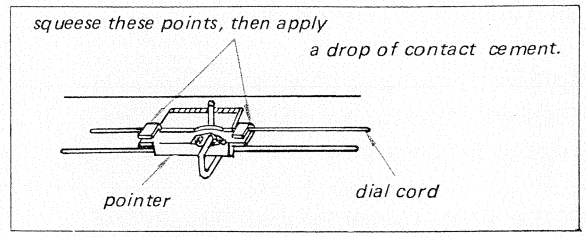


Fig. 2-18 Pointer installation

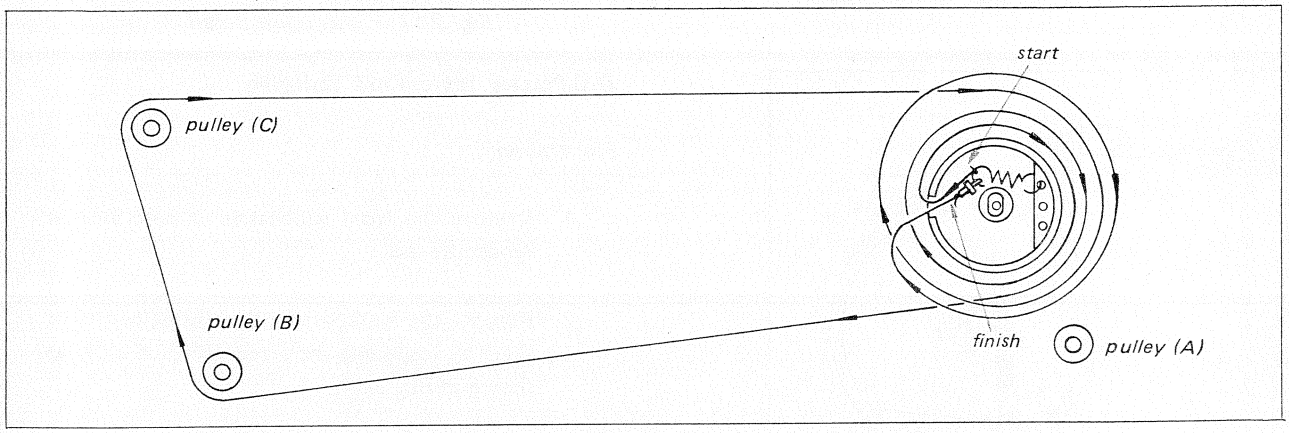
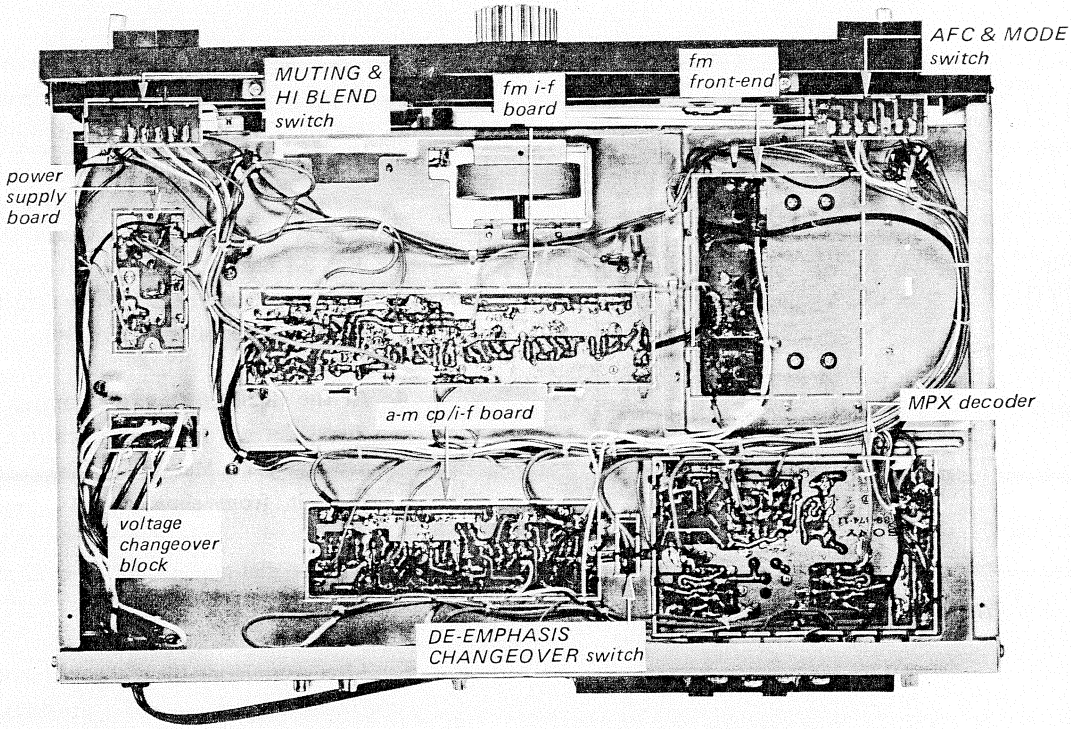


Fig. 2-19 Dial pointer driver cord stringing

2-14. CHASSIS LAYOUT



SECTION 3
ALIGNMENT AND ADJUSTMENT PROCEDURES

3-1. FM I-F STRIP ALIGNMENT

CAUTION

The ceramic filters in the fm i-f circuit are selected according to their specified center frequencies and color coded as shown in Fig. 3-1. and listed in Table 3-1. Check the color code of the filters to identify the same center frequency when replacing any of these filters.

TABLE 3-1.

FM I-F CERAMIC FILTERS		
Part No.	*Color*	*Specified Center Freq.*
1-403-562-11	red	10.70 MHz
1-403-562-21	black	10.66 MHz
1-403-562-31	white	10.74 MHz
1-403-562-41	green	10.62 MHz
1-403-562-51	yellow	10.78 MHz

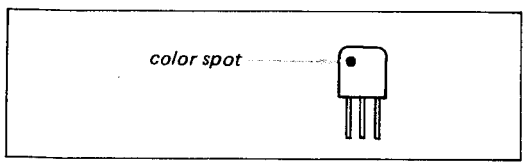


Fig. 3-1 Fm i-f ceramic filter

Test Equipment Required

1. Standard fm signal generator
2. Ac VTVM
3. Alignment tools

Note: Fm i-f strip alignment should be performed only after replacing IFT101 in the front end.

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Connect the input cable of the ac VTVM to the FIX terminal (J707).
3. Connect the signal-generator's output to the fm antenna terminal.

Procedure

1. With the equipment connected as shown in Fig. 3-2, set the signal-generator's controls as follows:

   Carrier frequency . . . . . 98 MHz
   Modulation . . . . . .Fm, 400 Hz, 100%
   Output level . . . . . 30 μV (30 dB)

2. Set the receiver's controls as follows:

   FUNCTION switch . . . . . .FM
   MODE switch . . . . . .MONO
   AFC switch . . . . . .OFF

3. Turn the core of transformer IFT101 (See Fig. 3-5) with the alignment tool to obtain maximum output.

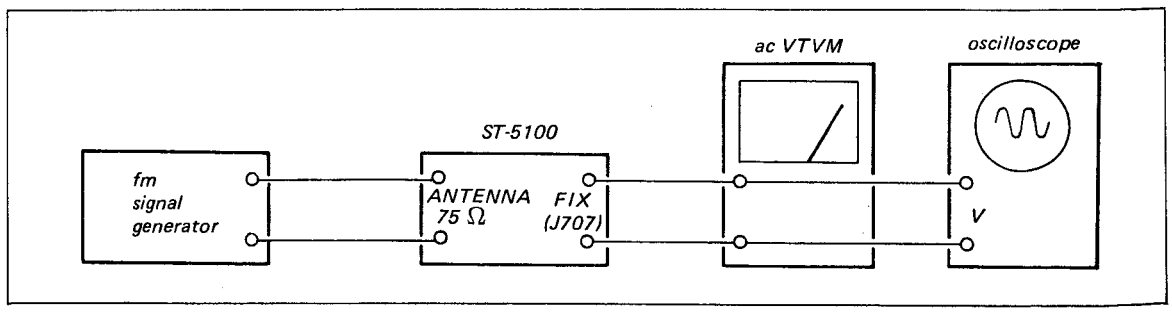


Fig. 3-2 I-f, muting and front-end alignment setup

3-2. FM DISCRIMINATOR ALIGNMENT

Note: There are two or three methods of discriminator alignment, but only the simplified method using the tuner's TUNING meter is described here.

Test Equipment Required

1. Oscilloscope
2. Alignment tools

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Connect the input cable of the oscilloscope to J707 (FIX jack).

Procedure

1. With the equipment connected as shown in Fig. 3-3, set the tuner's control as follows:

   FM-AM switch ..... FM
   MODE switch ..... MONO
   AFC switch ..... OFF

   No signal should be received.

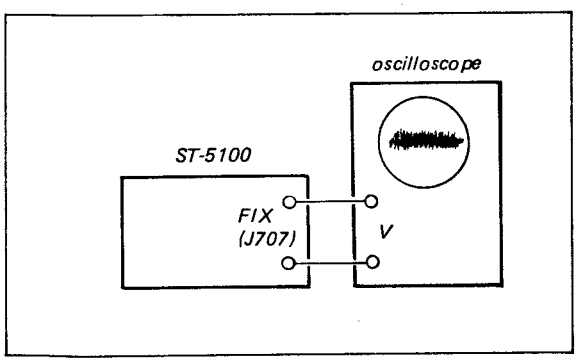


Fig. 3-3 Discriminator alignment test setup

2. Adjust the controls of the oscilloscope to provide a visible indication of noise.
   Always watch the oscilloscope to confirm that the tuner is not receiving any off-the-air signal.
3. Turn the top core (secondary side) of discriminator transformer T201 (see Fig. 3-4.) with a hex-head alignment tool to obtain a null-point reading on the tuning meter.

If the discriminator transformer (T201) is not aligned correctly, some deviation on the tuning meter will be observed.

Note: Turn the core carefully and slowly. At both extreme positions of the top core, a null point will be observed. The real null point should be obtained in the middle of the core thread length.

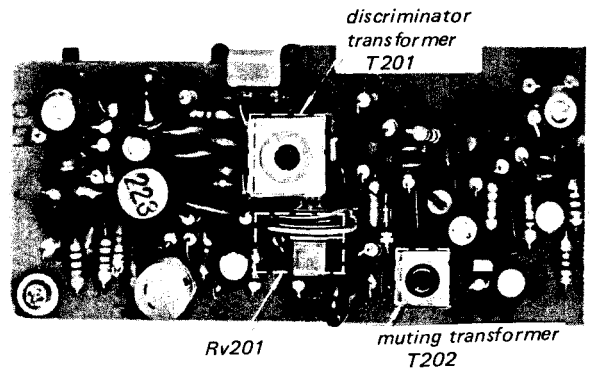


Fig. 3-4 Parts location

3-3. MUTING ADJUSTMENT

Note: Two methods of muting alignment are available, signal generator alignment and alignment by using an off-the-air signal. You can use either of them.

Signal Generator Alignment

Test Equipment Required

1. Fm standard signal generator
2. Ac VTVM or oscilloscope
3. Alignment tool

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Turn the knob of Rv201 (see Fig. 3-4) fully clockwise on the fm i-f and discriminator board.

Procedure

1. With the equipment connected as shown in Fig. 3-2, set the tuner's controls as follows:

FM-AM switch . . . . . .FM
MODE switch . . . . . MONO
AFC switch . . . . . OFF
MUTING switch . . . . . ON

2. Follow the procedure given in Table 3-2. Note that the muting circuit should begin to operate at the symmetrical deflection point on the TUNING meter when detuning the tuner to higher or lower than the reference carrier frequency.

Off-the-Air Signal Alignment

Accurate muting circuit adjustment can also be performed by utilizing off-the-air local fm signals instead of the fm S. S. G.
Note that a weak signal is best for this purpose.

3-4. FM FRONT-END ALIGNMENT (Frequency coverage)

Never attempt alignment of the front-end section except for the frequency-coverage and dial-calibration adjustments. The front-end section of the tuner has been carefully adjusted at the factory, so very little adjustment is necessary in the field.
Alignment need not be performed when the front-end FET is replaced since changes in FET parameters have little effect upon tuning. If an rf-stage adjustment is required, ask your nearest SONY Service Station to send your unit to the Factory Service Center for a complete front-end alignment. Exercise caution when returning the faulty unit so that it is not damaged in transit. The warranty will not cover damage incurrent in transit to the Factory Service Center.

Note: Before starting this alignment, the discriminator transformer alignment should be performed.

Signal Generator Alignment

Test Equipment Required

1. Standard fm signal generator
2. Ac VTVM or oscilloscope
3. Alignment tools

Preparation

1. Remove the top cover as described in Procedure 2-3.
2. Connect the equipment as shown in Fig. 3-2.
3. Set the tuner's controls as follows:

FM-AM switch . . . . . FM
MODE switch . . . . . MONO
AFC switch . . . . . OFF

Procedure

Follow the procedures given in Table 3-3 when performing this alignment with an fm signal generator.

TABLE 3-2. MUTING ADJUSTMENT

Coupling Between Front End and S.S.G.	SSG Frequency and Output Level	Tuner Dial Indication	Scope Connection	Adjust	Remarks
Direct	98 MHz 400 Hz. 30% Mod 30 μV (30 dB)	98 MHz	J707	T202	Turn the core of T202 (See Fig. 3-4) to obtain proper muting operation.

TABLE 3-3. FM FREQUENCY COVERAGE ADJUSTMENT						
Step	Coupling Between Front End and S.S.G.	SSG Frequency and Output Level	Tuner dial	Scope Connection	Adjust	Indication
1.	Direct to 75 Ω input terminal	87 MHz 400 Hz 100 % Mod. 30 μV (30 dB)	87 MHz	FIX (J707)	OSC coil (L104) See Fig. 3-5	Maximum
2.	Same as above	108 MHz 400 Hz 100 % Mod. 30 μV (30 dB)	108 MHz	Same as above	OSC trimmer (CT104) See Fig. 3-5	Same as above

Off-the-Air Alignment

Accurate dial calibration and a frequency-coverage test can also be performed by utilizing off-the-air local fm signals. However, before performing the following procedure, be sure that the dial scale is correctly positioned, as described in Procedure 2-13.

Procedure

1. Tune the receiver to the lowest-frequency station.
2. Check the dial scale for a calibration accuracy of ±200 kHz from the carrier frequency of the station. If the dial-accuracy deviation exceeds this limit, turn local-oscillator coil L104 slightly as shown in Fig. 3-5 until optimum dial calibration is obtained.

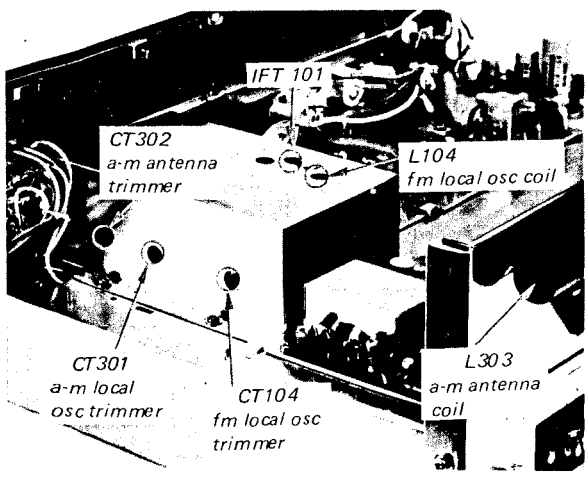


Fig. 3-5 Parts location

3. Tune the receiver to the highest-frequency station in your locality. If the dial-calibration error is excessive, adjust local-oscillator trimmer CT104 to obtain maximum calibration accuracy. See Fig. 3-5.

3-5. FM STEREO SEPARATION ADJUSTMENT

Test Equipment Required

1. MPX stereo signal generator
2. Audio oscillator
3. Oscilloscope and VTVM
4. Alignment tool

Preparation

Before starting the stereo-separation adjustment, check and adjust the phase between the 19-kHz pilot signal and the subchannel signal in the MPX stereo generator as follows:

(1) With the equipment connected as shown in Fig. 3-6, set the MPX and audio signal-generator's controls as follows:

MAIN CHANNEL . . . . . OFF
SUB CHANNEL . . . . . ON
PILOT (19 kHz) . . . . . OFF
AUDIO OSCILLATOR
OUTPUT . . . . . 400 Hz, 250 mV

(2) Adjust the oscilloscope controls to obtain a visible indication. Be sure the scope's horizontal display switch is set for external input.

(3) Turn the pilot-signal (19 kHz) phase control to obtain an in-phase and stable lissajous pattern as shown in Fig. 3-7.

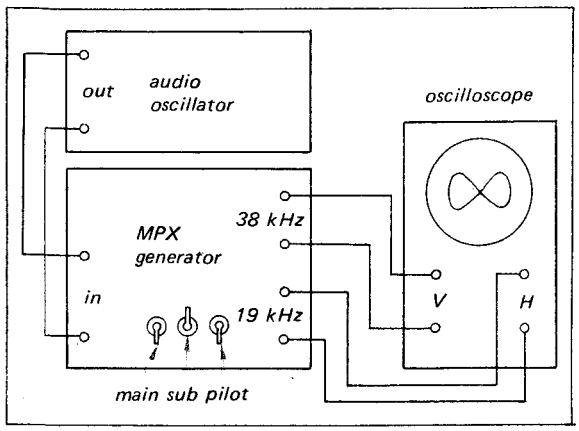


Fig. 3-6 MPX generator preadjustment setup

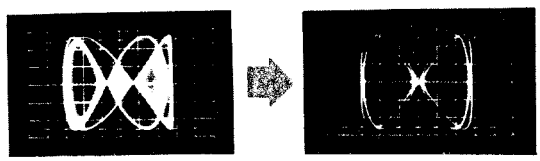


Fig. 3-7 Lissajous pattern

Procedure

1. Connect the equipment as shown in Fig. 3-8. Set the fm signal-generator's controls as follows:

   Carrier frequency . . . . . 98 MHz
   Output level . . . . . 30 μV (30 dB)

Modulation:

Main channel (400 Hz) . . . . . 33.75 kHz (45 %)
Sub channel (38 kHz) . . . . . 33.75 kHz (45 %)
Pilot (19 kHz) . . . . . 7.5 kHz (10 %)

The above-mentioned modulation levels can be set as follows:

(a) With the equipment connected as shown in Fig. 3-8, set the MPX stereo generator controls as follows:

MAIN CHANNEL . . . . . .OFF
SUB CHANNEL . . . . . .OFF
19 kHz (PILOT) . . . . . .ON

(b) Adjust the 19-kHz signal level to obtain a 7.5-kHz deviation on the FM SSG modulation indicator.

(c) Reset the MPX stereo-generator's controls as follows:

MAIN CHANNEL . . . . . .ON
SUB CHANNEL . . . . . .OFF
19 kHz (PILOT) . . . . . .OFF
INPUT SELECTOR . . . . . L-CH

(d) Adjust the audio-generator output (400 Hz) to obtain a 33.75-kHz deviation on the FM SSG modulation indicator.

(e) Set all controls to ON.

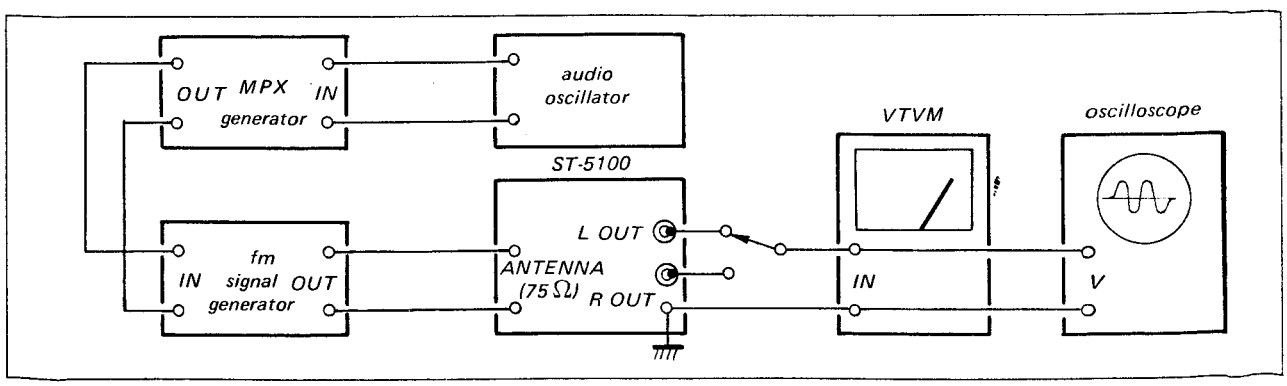


Fig. 3-8 Fm stereo separation adjustment test setup

2. Precisely tune the set to the SSG's carrier frequency, then turn the top core of switching transformer T104, to obtain maximum output at the left channel. See Fig. 3-9. Note that this adjustment has a close relationship with stereo distortion.

3. Record the output level of the left channel when the MPX generator input selector is set to the left channel.

4. Switch the input selector to the right channel and read the residual signal level in the left channel.

5. The output-level to residual-level ratio represents the separation. Adjust separation control Rv501 (see Fig. 3-9) for minimum residual level. Check the right channel for separation. Usually, about an 8 to 9 dB difference in channel separation exists. Readjust Rv501 for minimum difference between left-and right-channel separation. While doing this, remember that the output level also changes according to the setting of Rv501.

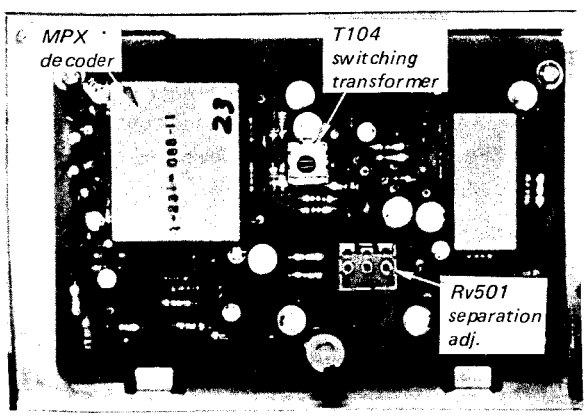


Fig. 3-9 Parts location

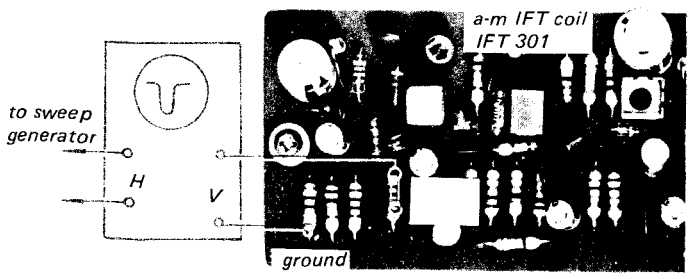


Fig. 3-11 A-m detector output connection

3-6. A-M I-F STRIP ALIGNMENT

Preparation

Remove the top cover and front-end shield cover. Then, set the receiver's FM-AM switch to AM.

Sweep Generator Alignment

Test Equipment Required

1. 455-kHz sweep generator
2. Oscilloscope
3. Alignment tool

Procedure

1. Connect the sweep generator's output across (variable capacitor) Cv301 as shown in Fig. 3-10.

   Set the sweep generator's control as follows:

   Center frequency . . . . . 455 kHz
   Sweep width . . . . . .25 kHz
   Output . . . . . .as low as possible

2. Connect the input cable of the oscilloscope to R321 and ground on the a-m tuner circuit board with alligator clips as shown in Fig, 3-11.

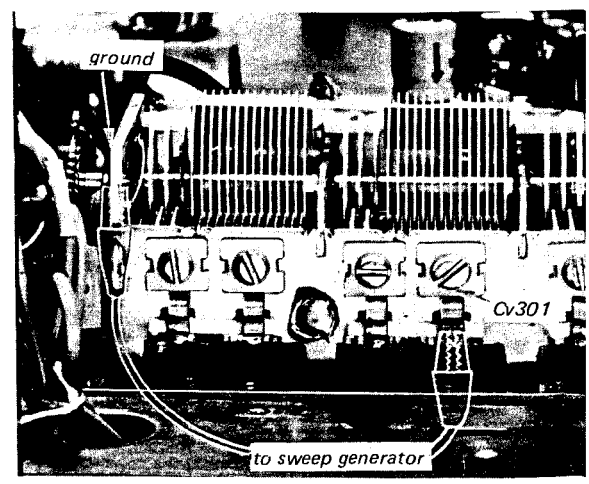


Fig. 3-10 445 kHz sweep signal injection

3. With the equipment connected as shown in Fig.. 3-13, adjust the oscilloscope controls and generator output to provide a visible indication.

4. Turn the top core of (IFT301) (see Fig. 3-11) to obtain a maximum and symmetrical response as shown in Fig. 3-12.

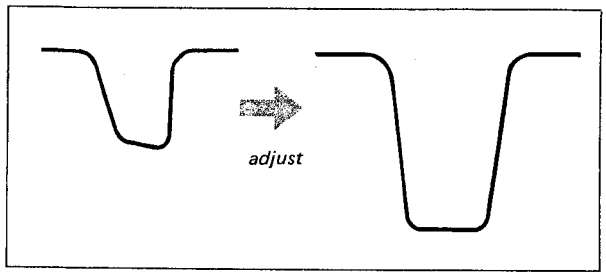


Fig. 3-12 A-m i-f response

Rf Signal Generator Method

Test Equipment Required

1. 455-kHz signal generator
2. Ac VTVM and oscilloscope
3. Alignment tool

Procedure

1. Set the rf signal generator's controls as follows:

   Modulation . . . . . .Internal
   Frequency . . . . . .455 kHz
   OUTPUT level . . . . . .1000μV (60 dB)

2. Connect the rf signal-generator's output across variable capacitor, Cv301 as shown in Fig. 3-10.

3. With the scope VTVM aconnected as shown in Fig. 3-14, turn the top core of IFT301 (see Fig. 3-11) to obtain maximum output.

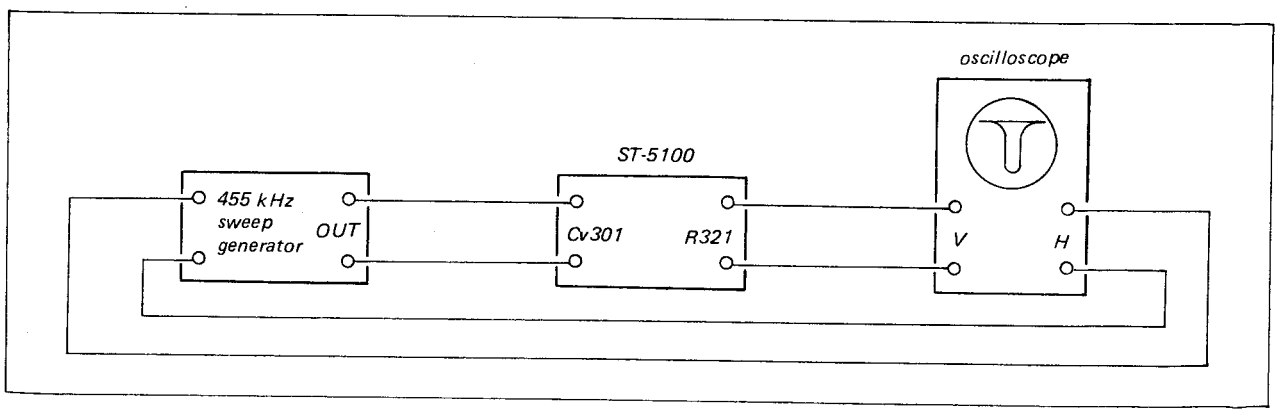


Fig. 3-13 A-m i-f strip alignment by sweep generator

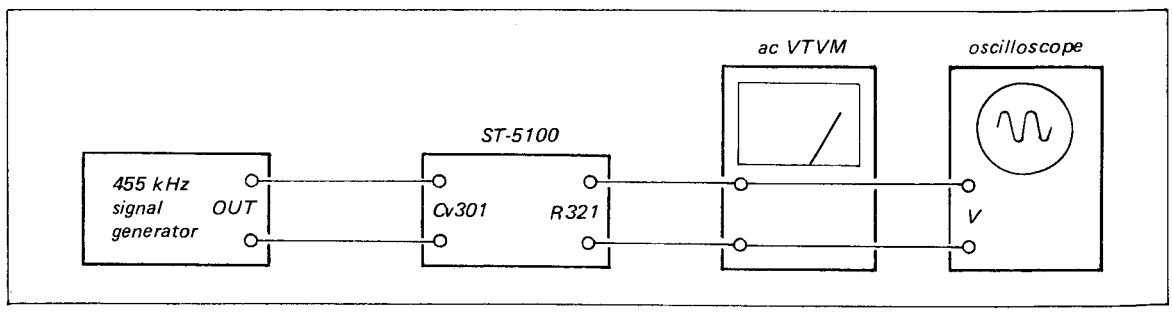


Fig. 3-14 A-m i-f strip alignment by rf generator

3-7. A-M FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Preparation

Remove the top cover as described in Procedure 2-3. Then, set the tuner's FM-AM switch to AM.

Signal Generator Method

Test Equipment Required

1. A-m signal generator
2. Loop antenna
3. Ac VTVM and oscilloscope
4. Alignment tool

Procedure

With the equipment connected as shown in Fig. 3-15, follow the procedures given in Table 3-4 and 3-5 when performing this alignment with an a-m signal generator.

TABLE 3-4. A-M FREQUENCY COVERAGE ADJUSTMENT

SSG Coupling	SSG Frequency and Output Level	Tuning Capacitor	Scope Connection	Adjust	Indication
Loop antenna	520 kHz 400 Hz 30 % Mod. 3000 μV (70 dB)	Maximum capacitance position	FIX jack (J707)	OSC coil L304 See Fig. 3-16	Maximum
Loop antenna	1,680 kHz Same as above	Minimum-capacitance position	Same as above	OSC trimmer CT301 See Fig. 3-5	Same as above

TABLE 3-5. A-M TRACKING ADJUSTMENT

SSG Coupling	SSG Frequency and Output Level	Tuning Capacitor	Scope Connection	Adjust	Indication
Loop antenna	620 kHz 400 Hz 30% Mod. Output Level as low as possible	Tune to 620 kHz	FIX (J707)	Position of antenna coil L303 See Fig. 3-5	Maximum
Loop antenna	1,400 kHz same as above	Tune to 1,400 kHz	Same as above	Antenna trimmer CT302 See Fig. 3-5	Same as above

Off-the-Air Signal Method

Accurate dial calibration, and a frequency-coverage and tracking test can also be performed by utilizing off-the-air local a-m signals. However, before performing the following procedure, be sure that the dial scale is correctly positioned, as in Procedure 2-13. Note that a weak signal is best for this purpose.

Frequency Coverage Adjustment

1. Tune the receiver to the lowest-frequency station in your locality.
   If the dial calibration error exceeds ±15 kHz from the station carrier frequency, turn local oscillator coil L304 (shown in Fig. 3-16) slightly until optimum dial calibration is obtained.

2. Tune the receiver to the highest-frequency station in your locality. If the dial calibration error exceeds ±30 kHz from the station carrier frequency, adjust local-oscillator trimmer-capacitor CT301 (see Fig. 3-5) to obtain maximum calibration accuracy.

Tracking Adjustment

1. Tune the set to the station whose carrier frequency is closest to 620 kHz and adjust the position of antenna coil L303 as shown in Fig. 3-5 to obtain maximum output.

2. Tune the set to the station whose carrier frequency is closest to 1400 kHz and adjust antenna trimmer CT302 to obtain maximum output. See Fig. 3-5.

3. Repeat the above steps two or three times.

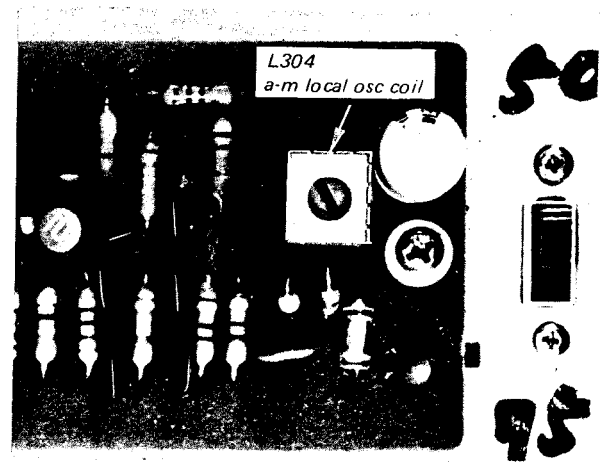


Fig. 3-16 Parts location

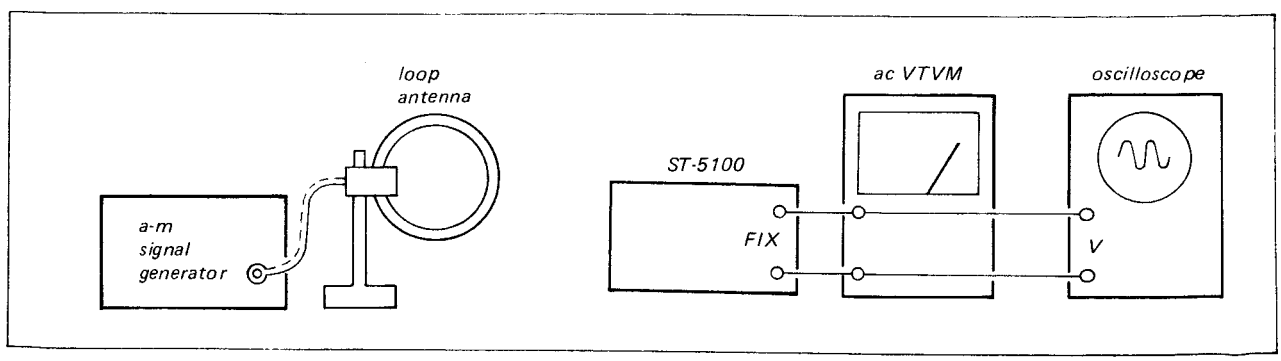


Fig. 3-15 A-m frequency coverage and tracking adjustment test setup

SECTION 4
REPACKING

The ST-5100's original shipping carton and packing material is the ideal container for shipping the unit. However, to secure the maximum protection the ST-5100 must be repacked in this material precisely as before. The proper repacking procedure is shown in Fig. 4-1.

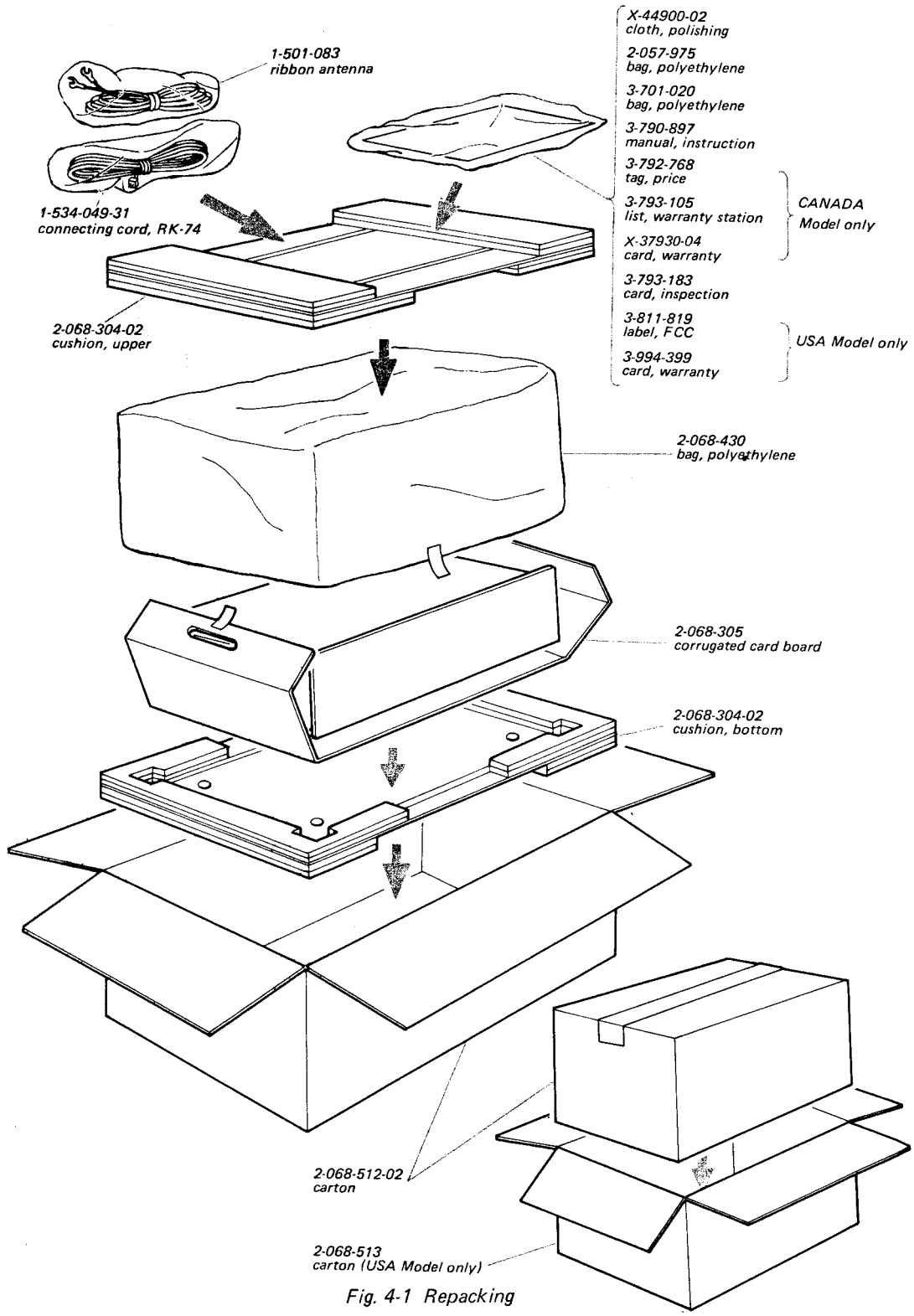
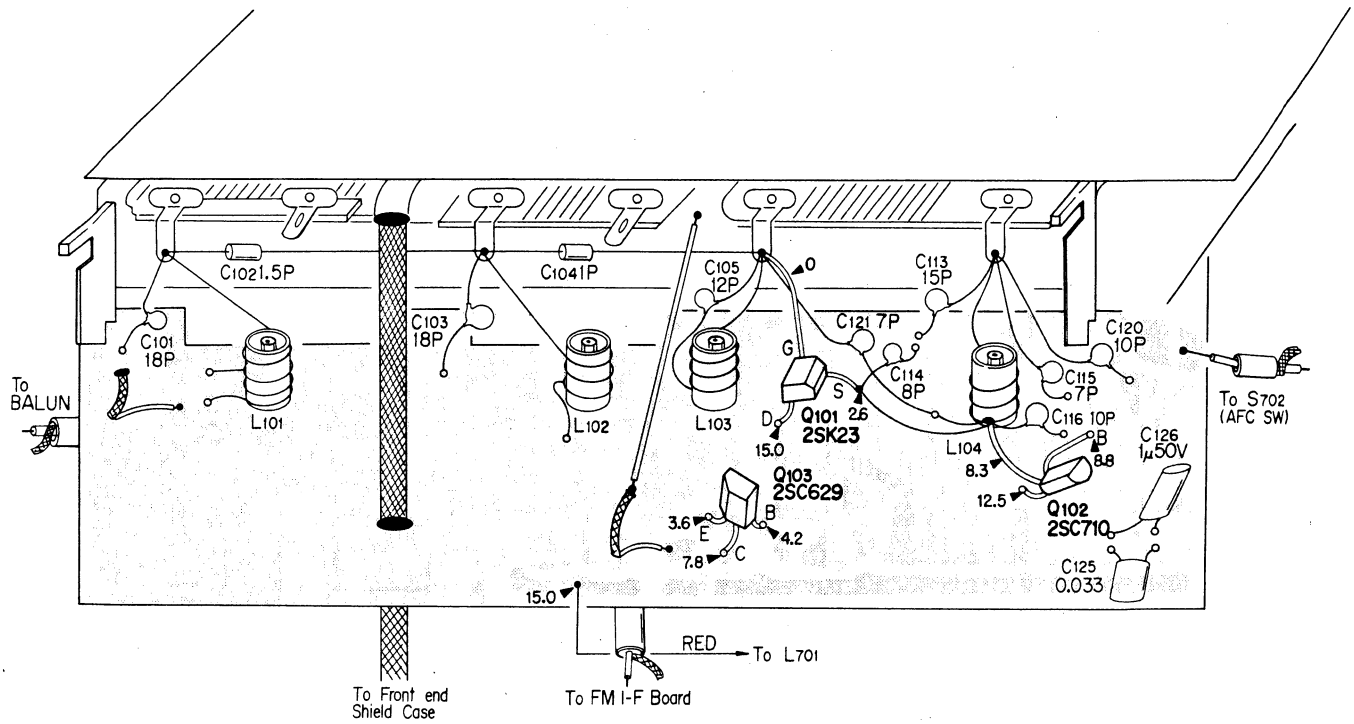


Fig. 4-1 Repacking

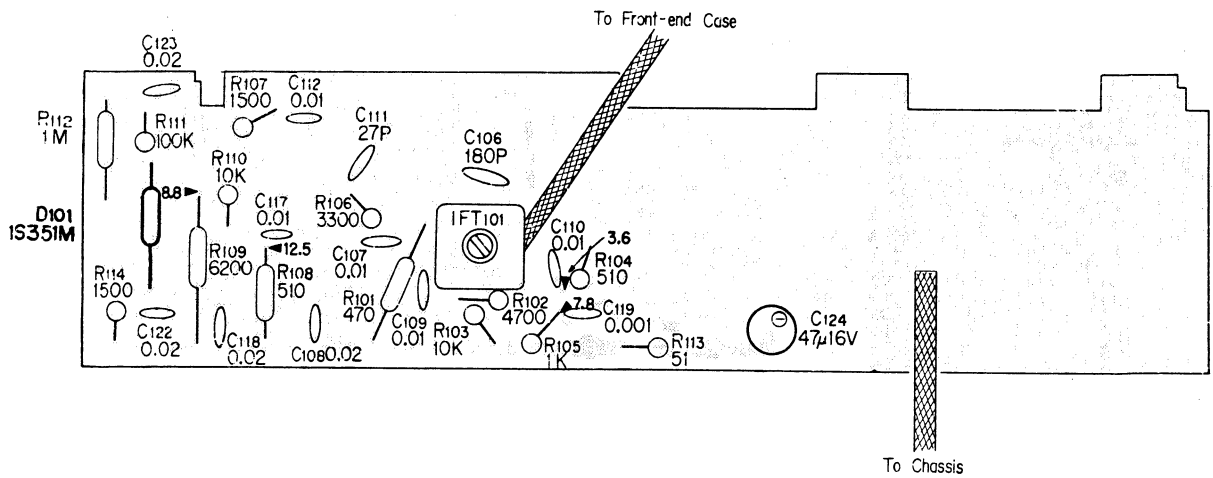
SECTION 5
DIAGRAMS

5-1. MOUNTING DIAGRAM–Fm Front-end Board

Conductor Side–

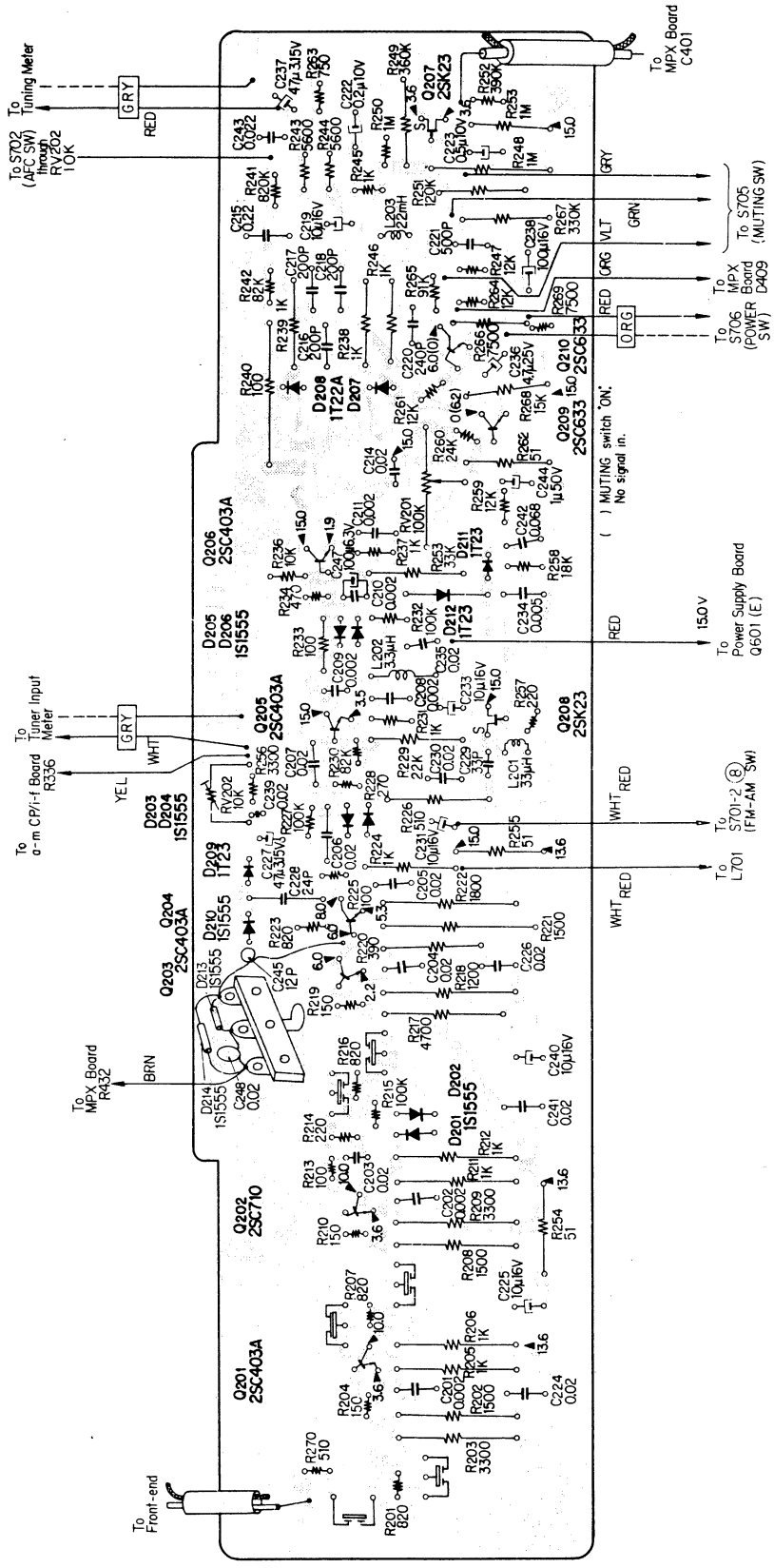


Component Side–



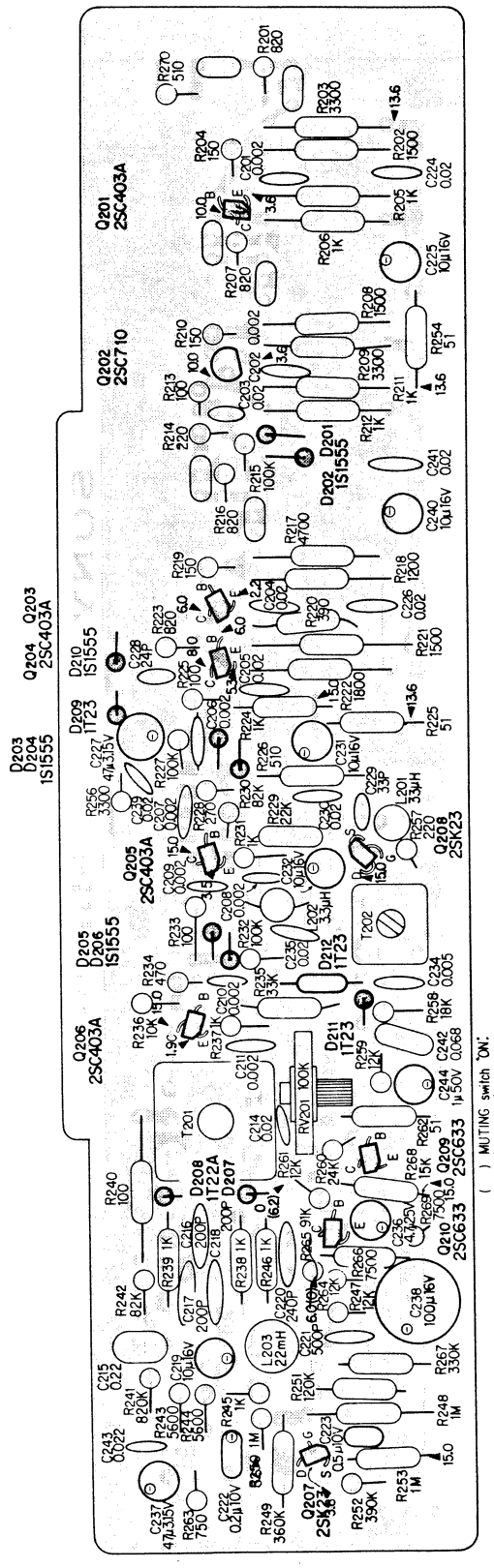
5-2. MOUNTING DIAGRAM–Fm I-f Board

–Conductor Side–



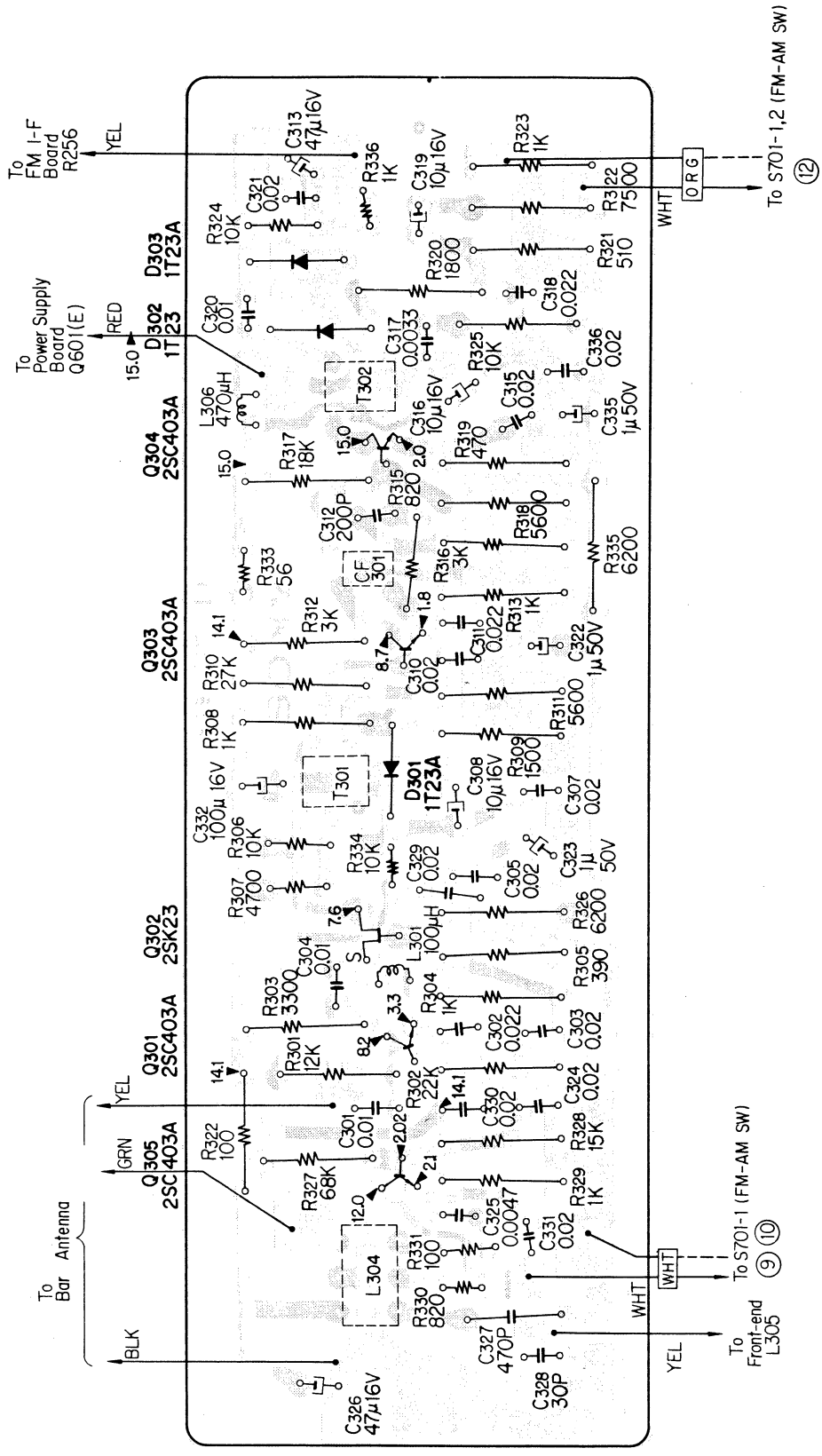
5-2. MOUNTING DIAGRAM–Fm I-f Board

–Cpmponent Side–



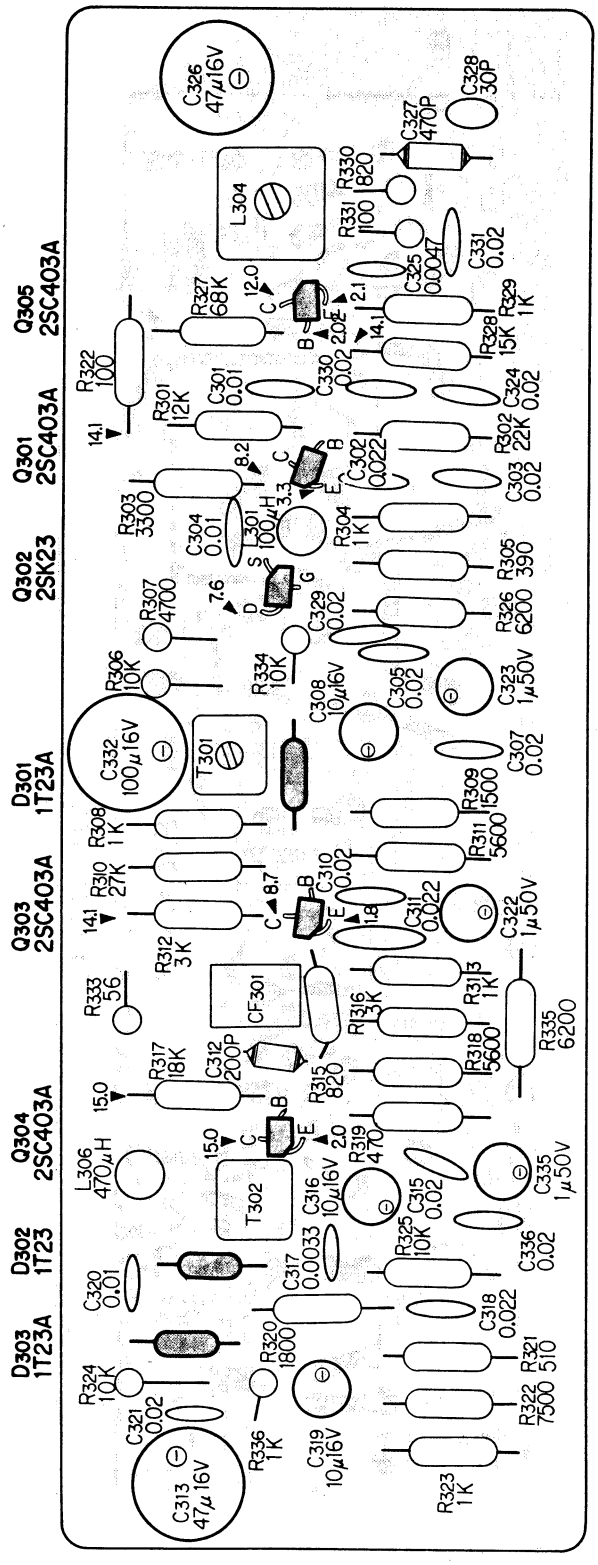
5-3. MOUNTING DIAGRAM–A-m Cp/I-f Board

–Conductor Side–



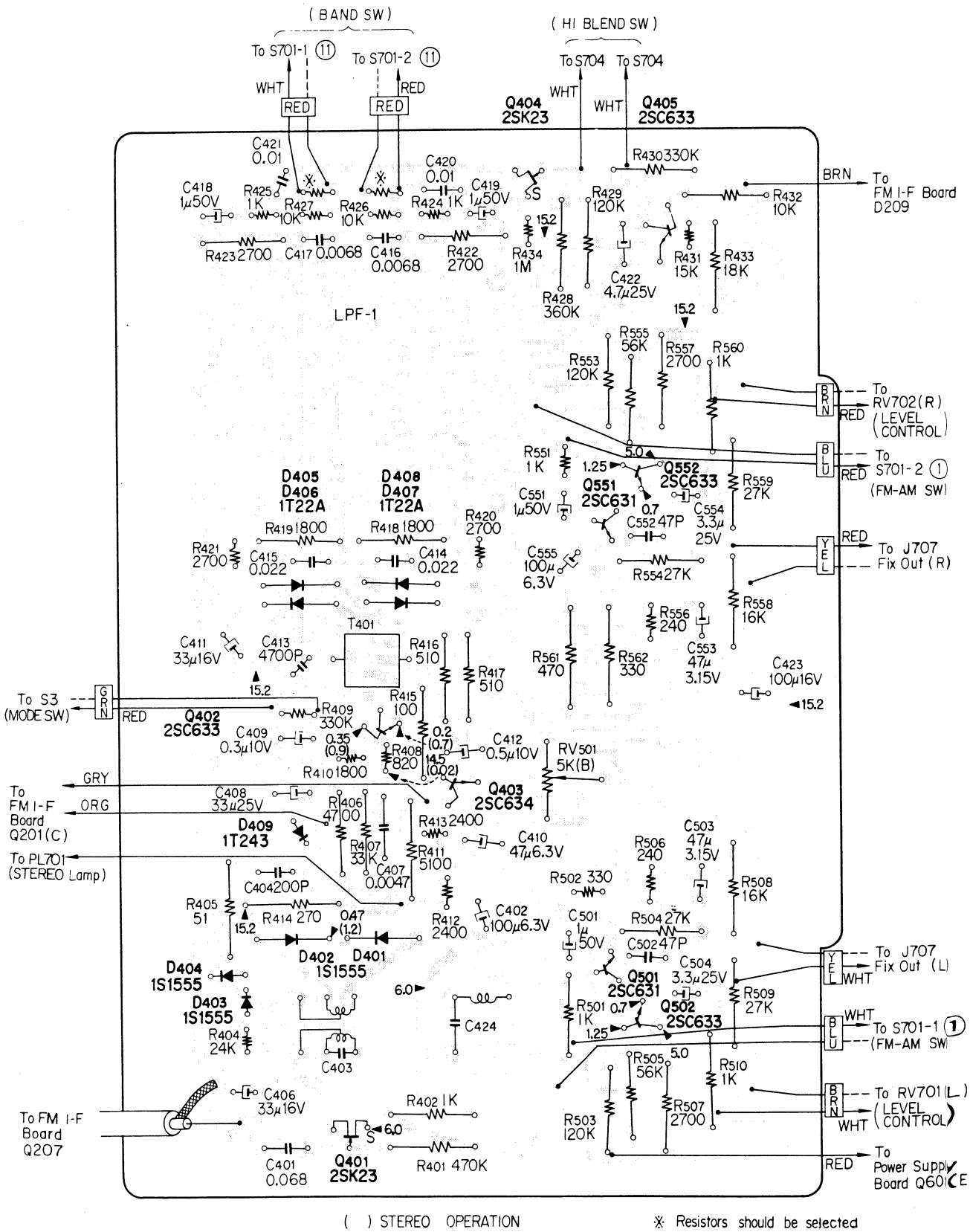
5-3. MOUNTING DIAGRAM–A-m Cp/I-f Board

–Component Side–



5-4. MOUNTING DIAGRAM–MPX Decoder Board

–Conductor Side–

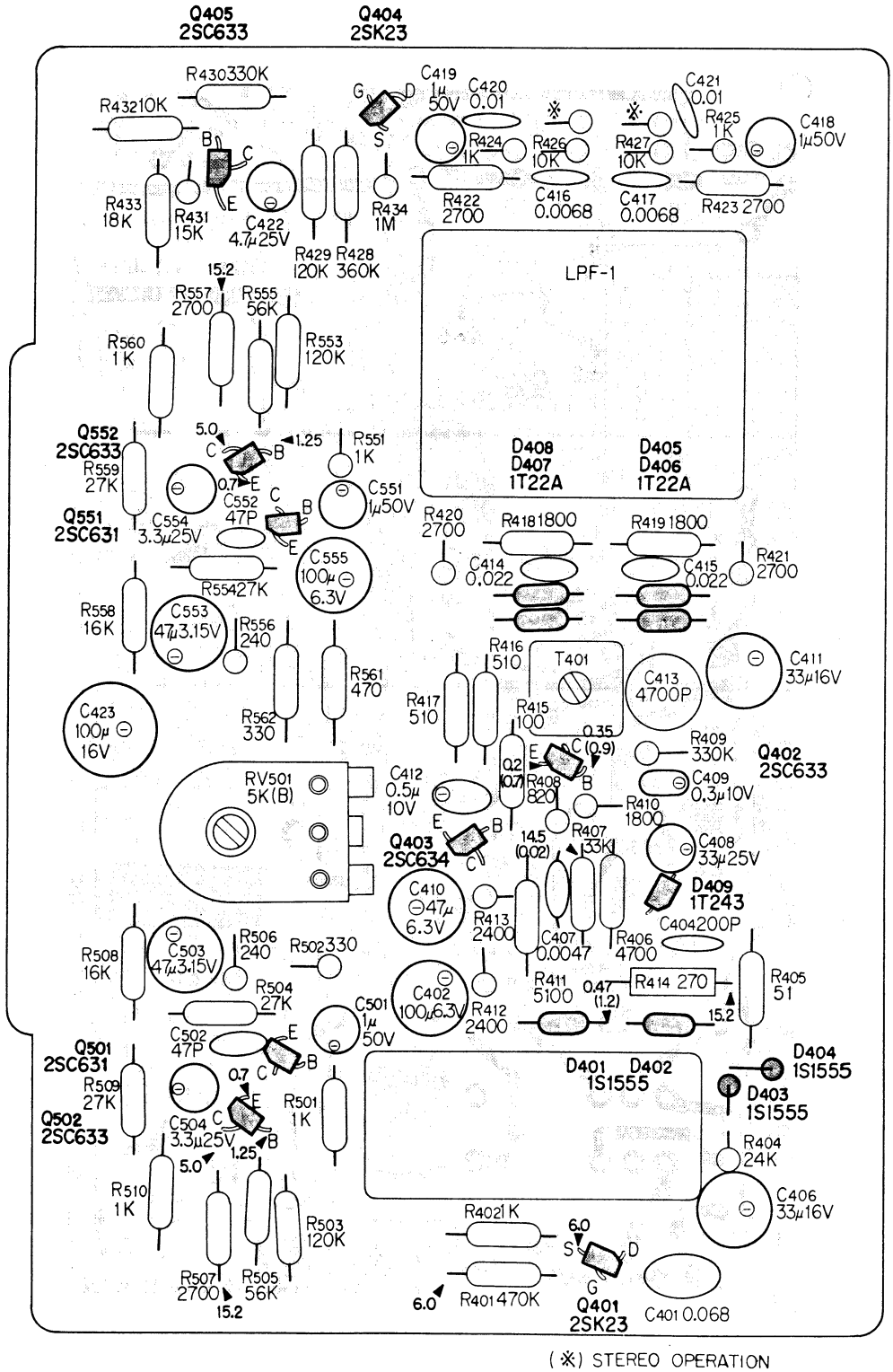


( ) STEREO OPERATION

※ Resistors should be selected

5-4. MOUNTING DIAGRAM–MPX Decoder Board

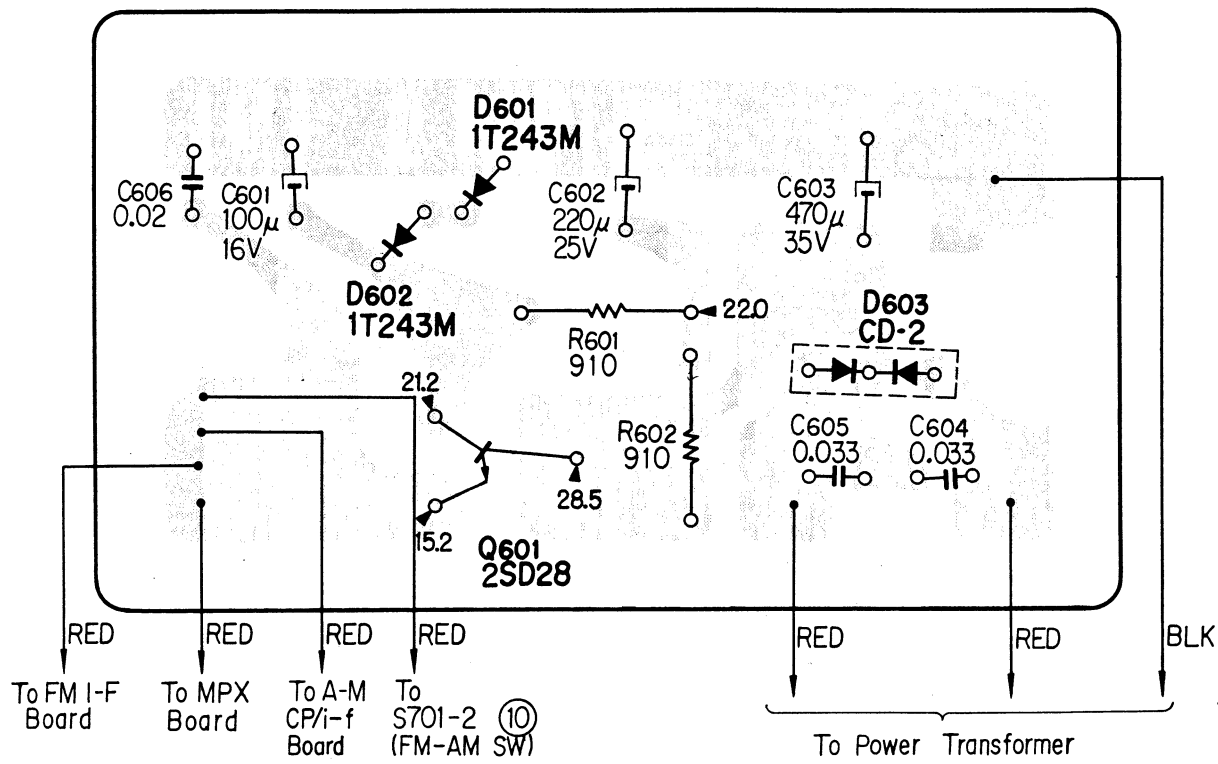
–Component Side–



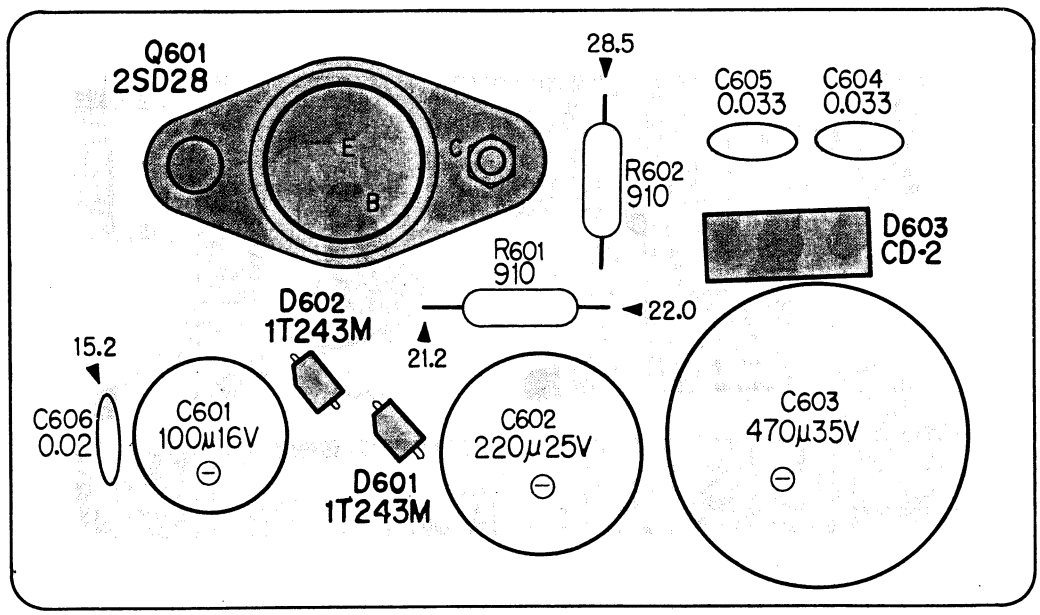
(※) STEREO OPERATION

5-5. MOUNTING DIAGRAM–Power Supply Board

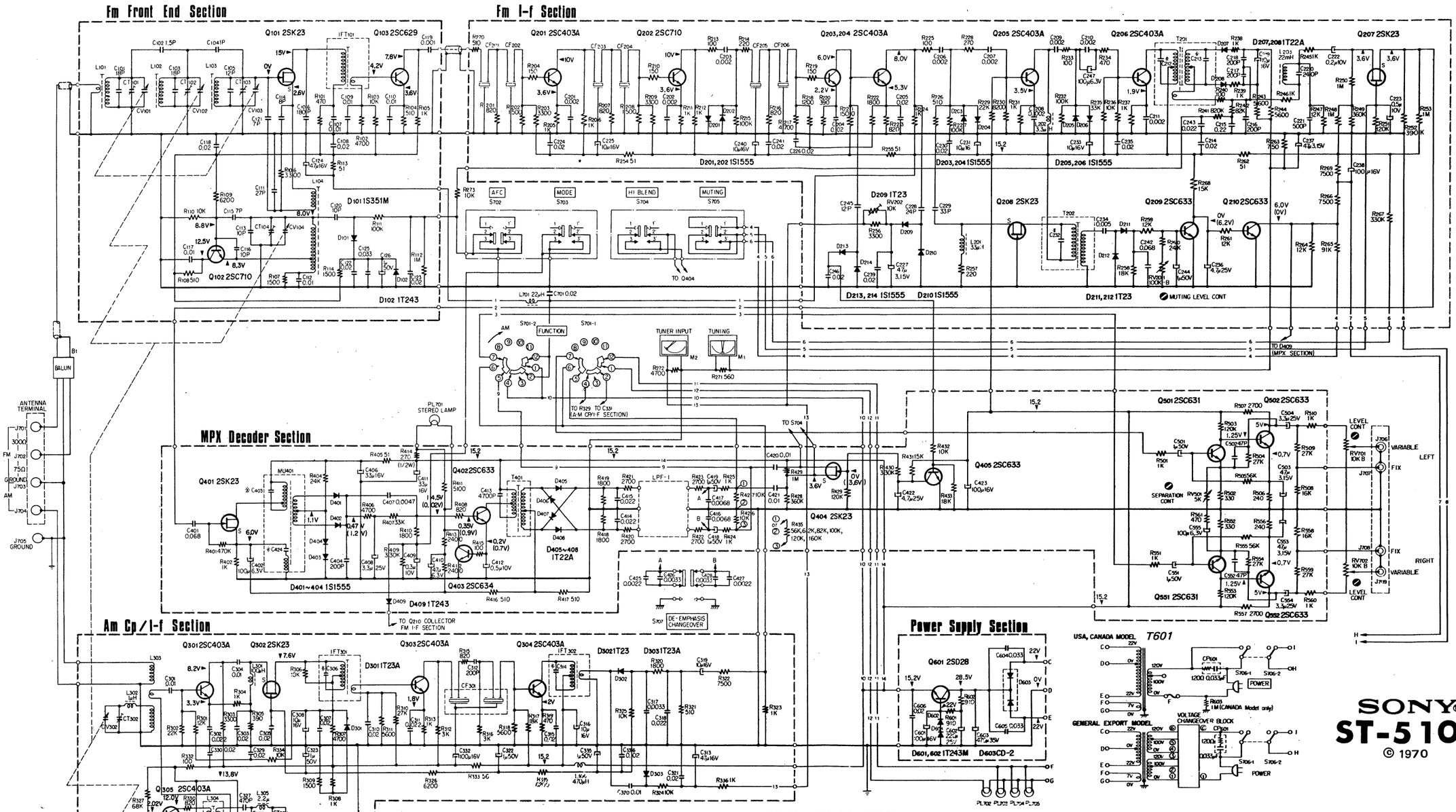
–Conductor Side–



–Component Side–

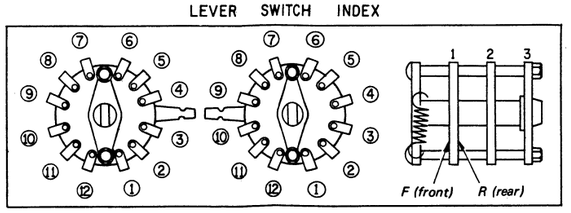


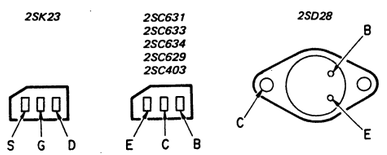
5-6. SCHEMATIC DIAGRAM



Symbol	Description	Position
S701	FM-AM switch	FM
S702	AFC switch	OFF
S703	MODE switch	STEREO
S704	HI BLEND switch	HI BLEND
S705	MUTING switch	ON
S706	POWER switch	OFF
S707	De-emphasis switch	75 μ sec

LEVER SWITCH INDEX





Note:

All resistance values are in ohms. k=1000, M=1000 k

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ± 20%.

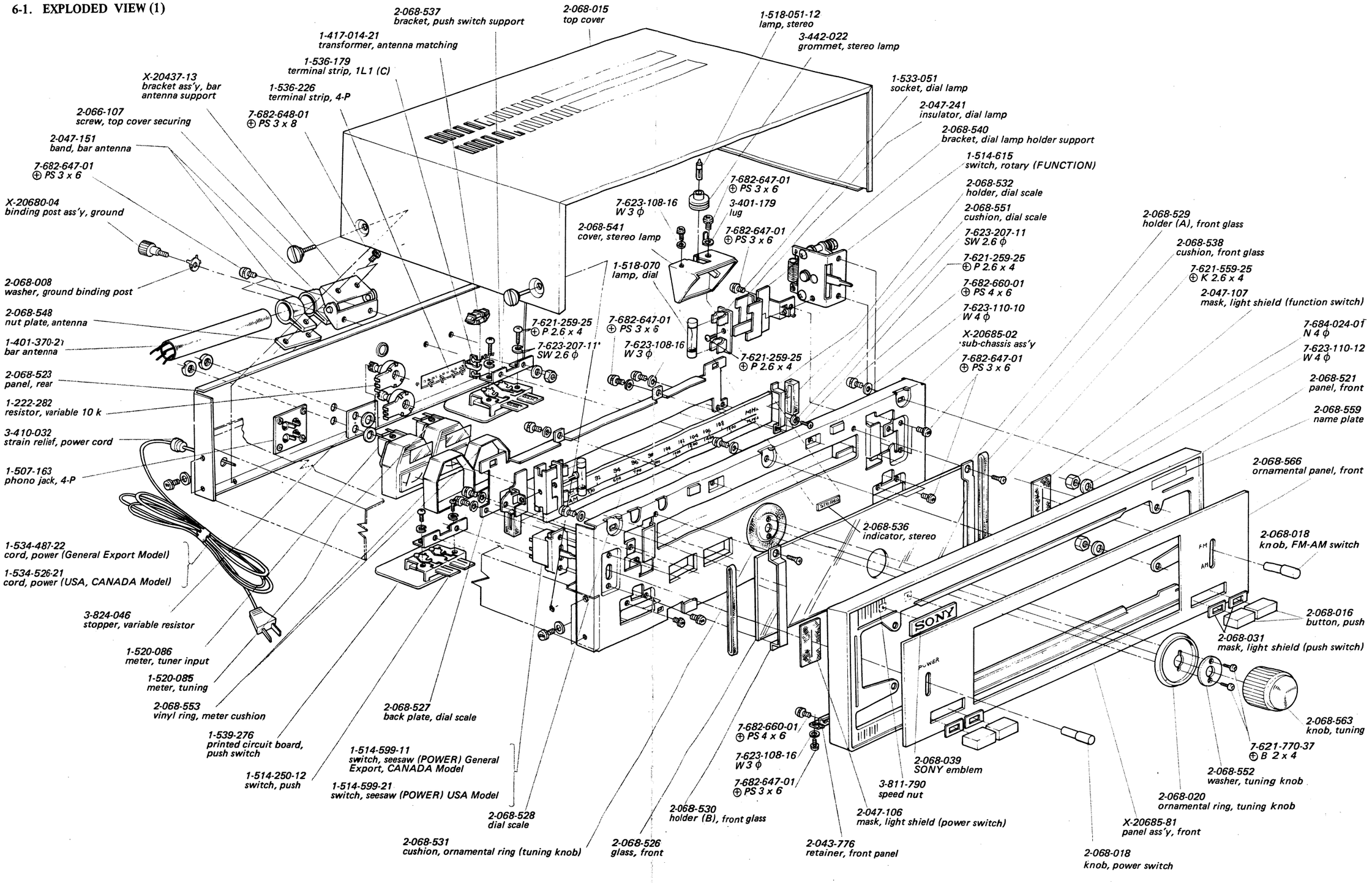
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in. [ ] signal voltages are measured with ac VTVM and expressed in dBm refered to 0.775 volts, 1 kHz.

SONY®
ST-5100
© 1970

Pointer X-20685-05-

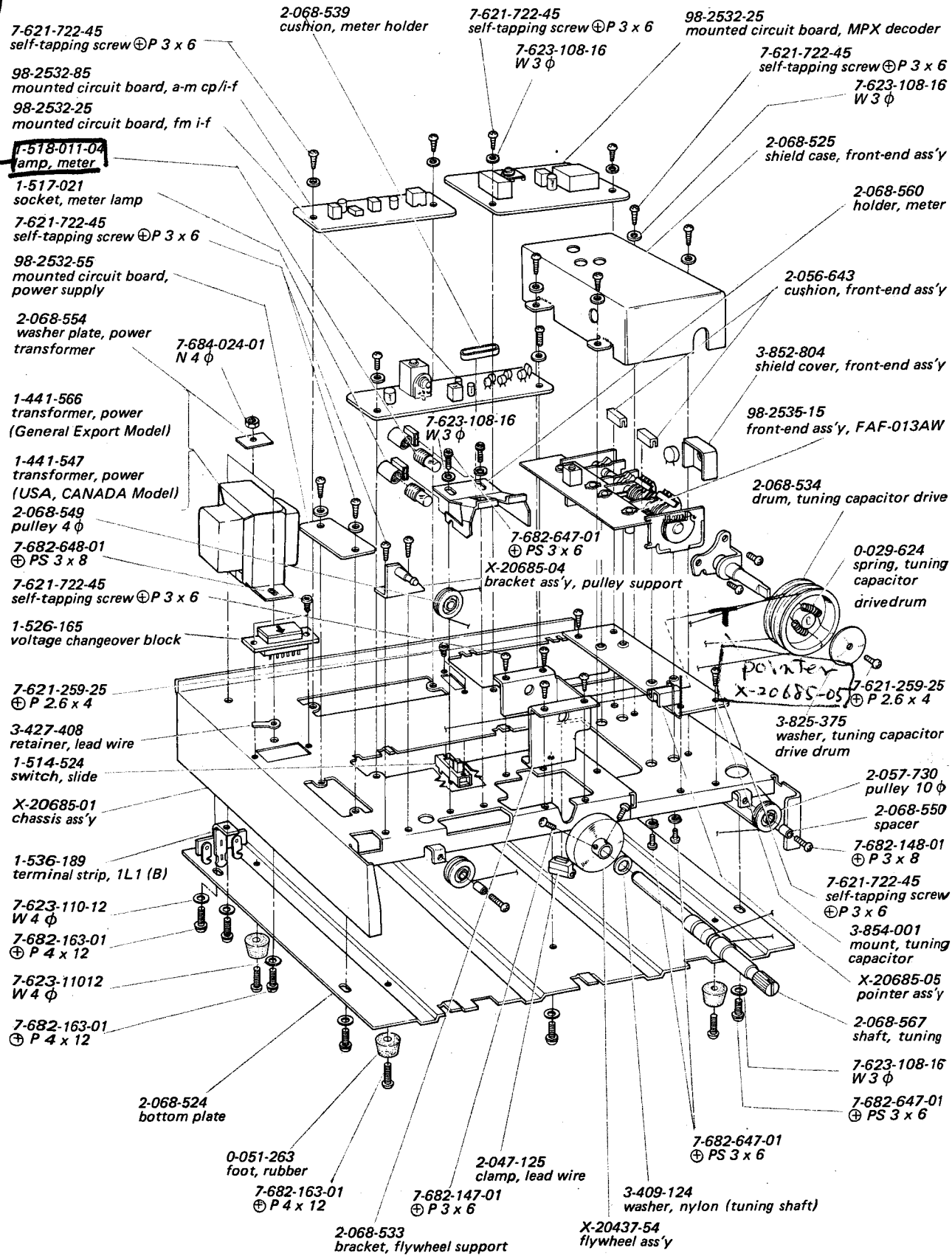
SECTION 6
EXPLODED VIEW

6-1. EXPLODED VIEW (1)



→ 9-919-305-00 Lamp Green

6-2. EXPLODED VIEW (2)


7-621-722-45 self-tapping screw ⊕P 3 x 6
98-2532-85 mounted circuit board, a-m cp/i-f
98-2532-25 mounted circuit board, fm i-f
1-518-011-04 lamp, meter
1-517-021 socket, meter lamp
7-621-722-45 self-tapping screw ⊕P 3 x 6
98-2532-55 mounted circuit board, power supply
2-068-554 washer plate, power transformer
7-684-024-01 N 4 ϕ
1-441-566 transformer, power (General Export Model)
1-441-547 transformer, power (USA, CANADA Model)
2-068-549 pulley 4 ϕ
7-682-648-01 ⊕ PS 3 x 8
7-621-722-45 self-tapping screw ⊕P 3 x 6
1-526-165 voltage changeover block
7-621-259-25 ⊕ P 2.6 x 4
3-427-408 retainer, lead wire
1-514-524 switch, slide
X-20685-01 chassis ass'y
1-536-189 terminal strip, 1L1 (B)
7-623-110-12 W 4 ϕ
7-682-163-01 ⊕ P 4 x 12
7-623-11012 W 4 ϕ
7-682-163-01 ⊕ P 4 x 12
2-068-524 bottom plate
0-051-263 foot, rubber
7-682-163-01 ⊕P 4 x 12
2-068-533 bracket, flywheel support
7-682-147-01 ⊕P 3 x 6
2-047-125 clamp, lead wire
X-20437-54 flywheel ass'y
3-409-124 washer, nylon (tuning shaft)
7-682-647-01 ⊕ PS 3 x 6
2-068-567 shaft, tuning
X-20685-05 pointer ass'y
3-854-001 mount, tuning capacitor
7-621-722-45 self-tapping screw ⊕P 3 x 6
7-682-148-01 ⊕ P 3 x 8
2-068-550 spacer
2-057-730 pulley 10 ϕ
3-825-375 washer, tuning capacitor drive drum
7-621-259-25 ⊕ P 2.6 x 4
pointer
X-20685-05
0-029-624 spring, tuning capacitor drivedrum
2-068-534 drum, tuning capacitor drive
98-2535-15 front-end ass'y, FAF-013AW
3-852-804 shield cover, front-end ass'y
2-056-643 cushion, front-end ass'y
2-068-560 holder, meter
2-068-525 shield case, front-end ass'y
7-623-108-16 W 3 ϕ
98-2532-25 mounted circuit board, MPX decoder
7-621-722-45 self-tapping screw ⊕P 3 x 6
2-068-539 cushion, meter holder
7-621-722-45 self-tapping screw ⊕P 3 x 6
7-623-108-16 W 3 ϕ
7-623-108-16 W 3 ϕ
7-682-647-01 ⊕ PS 3 x 6
X-20685-04 bracket ass'y, pulley support

SECTION 7
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	Mounted Circuit Boards	
	98-2532-25	F-M I-F circuit board
	98-2532-75	MPX decoder circuit board
	98-2532-85	A-M CP/I-F circuit board
	98-2532-55	power supply circuit board
	98-2535-15	front-end ass'y, FAF-013AW
	Diodes	
D101		diode, 1S351M
D102		" 1T243
D201		diode, 1S1555
D202		" "
D203		" "
D204		" "
D205		" "
D206		" "
D207		" 1T22A
D208		" "
D209		" 1T23
D210		" "
D211		" "
D212		" "
D301		diode, 1T23A
D302		" 1T23
D303		" 1T23A
D401		diode, 1S1555
D402		" "
D403		" "
D404		" "
D405		" 1T22A
D406		" "
D407		" "
D408		" "
D409		" 1T243
D601		diode, 1T243
D602		" "
D603		" CD-2
	Transistors	
Q101		FET, 2SK 23
Q102		transistor, 2SC710
Q103		transistor, 2SC629
Q201		transistor, 2SC403A
Q202		" 2SC710
Q203		" 2SC403A
Q204		" "
Q205		" "
Q206		" "
Q207		FET, 2SK23
Q208		" "
Q209		transistor, 2SC633
Q210		" "
Q301		transistor, 2SC403A
Q302		FET, 2SK23
Q303		transistor, 2SC403A
Q304		" "
Q305		" "
Q401		FET, 2SK23
Q402		transistor, 2SC633
Q403		" 2SC634
Q404		FET, 2SK23
Q405		transistor, 2SC633
Q501(Q551)		transistor, 2SC631
Q502(Q552)		" 2SC633
Q601		transistor, 2SD28
	Transformers, Coils and Inductors	
B1	1-417-014-21	transformer, antenna matching
IFT101	1-403-295	IFT, fm
IFT301	1-403-152	IFT, a-m
IFT302	1-403-128	" "
L101	1-401-351	coil, fm antenna
L102	1-425-446	coil, fm rf
L103	1-425-446	" "
L104	1-405-377	coil, fm osc
L201	1-407-163	inductor, micro 33μH
L202	1-407-184	inductor, micro 3.3μH
L203	1-407-408	inductor, micro 22mH

Ref. No.	Part No.	Description
L301	1-407-169	inductor, micro 100μH
L302	1-407-178	inductor, micro 1.0μH
L303	1-401-370-21	bar antenna, a-m
L304	1-405-359	coil, a-m osc
L305	1-407-182	inductor, micro 2.2μH
L306	1-407-177	inductor, micro 470μH
L701	1-407-026	inductor, micro 22μH
MU401	1-425-548	MPX unit
T201	1-403-291	transformer, discriminator 10.7MHz
T202	1-403-299	IFT, f-m 10.7MHz
T401	1-425-260-12	transformer, switching 38kHz
T601	1-441-547	transformer, power (USA, CANADA Model)
	1-441-566	transformer, power (General Export Model)

Capacitors

All capacitance values are in μF, except as indicated with, p which means μμF.

Ref. No.	Part No.	Description
C101	1-101-862	18p ±5% 50V ceramic
C102	1-101-938	1.5p ±10% 500V "
C103	1-101-862	18p ±5% 50V "
C104	1-101-937	1p ±10% 500V "
C105	1-101-961	12p ±5% 50V "
C106	1-102-985	180p " " "
C107	1-101-072	0.01 $\pm^{80}_{20}$% 25V "
C108	1-101-073	0.02 " " "
C109	1-101-072	0.01 " " "
C110	1-101-072	" " " "
C111	1-101-869	27p ±5% 50V "
C112	1-102-077	0.01 ±20% " "
C113	1-101-873	15p ±5% " "
C114	1-101-958	8p ±0.5p " "
C115	1-102-875	7p ±5% " "
C116	1-101-978	10p " " "
C117	1-101-072	0.01 $\pm^{80}_{20}$% 25V "
C118	1-101-073	0.02 " " "
C119	1-101-918	0.001 " " "
C120	1-101-986	10p ±5% 50V "
C121	1-101-957	7p ±0.5p " "
C122	1-101-073	0.02 $\pm^{80}_{20}$% 25V "
C123	1-101-073	" " " "
C124	1-121-353	47 $\pm^{100}_{10}$% 16V electrolytic
C125	1-105-679-12	0.033 ±10% 50V mylar
C126	1-121-343	1 $\pm^{150}_{10}$% " electrolytic
C201	1-101-919	0.002 $\pm^{80}_{20}$% 25V ceramic
C202	1-101-919	" " " "
C203	1-101-919	" " " "
C204	1-101-073	0.02 " " "
C205	1-101-073	" " " "
C206	1-101-919	0.002 " " "
C207	1-101-919	" " " "
C208	1-101-919	" " " "
C209	1-101-919	" " " "
C210	1-101-919	" " " "
C211	1-101-919	" " " "
C212, C213		Included in T201
C214	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C215	1-105-689-12	0.22 ±10% 50V mylar
C216	1-101-030	200p ±5% " ceramic
C217	1-101-030	" " " "
C218	1-101-030	" " " "
C219	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C220	1-107-140	240p ±10% 50V silvered mica
C221	1-101-424	500p ±20% 250V ceramic
C222	1-127-020	0.2 " 10V electrolytic (aluminum)
C223	1-127-021	0.3 " " "
C224	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C225	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C226	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C227	1-121-287	47 $\pm^{100}_{10}$% 3.15V electrolytic
C228	1-101-867	24p ±5% 25V ceramic
C229	1-101-872	33p " " "
C230	1-101-073	0.02 $\pm^{80}_{20}$% " "
C231	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C232		Included in T202
C233	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C234	1-101-904	0.005 $\pm^{80}_{20}$% 50V ceramic
C235	1-101-073	0.02 " 25V "
C236	1-121-281	4.7 $\pm^{100}_{10}$% " electrolytic
C237	1-121-287	47 " 3.15V "
C238	1-121-356	100 " 16V "
C239	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C240	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C241	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C242	1-105-683-12	0.068 ±10% 50V mylar
C243	1-105-837-12	0.022 " " "

Ref. No.	Part No.	Description
C244	1-121-391	1 $\pm^{150}_{10}$% 50V electrolytic
C245	1-101-961	12p ±5% " ceramic
C246	1-101-073	0.02 $\pm^{80}_{20}$% 25V "
C247	1-121-491	100 " " electrolytic
C301	1-101-072	0.01 $\pm^{80}_{20}$% 25V ceramic
C302	1-105-837-12	0.022 " " " mylar
C303	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C304	1-101-072	0.01 " " "
C305	1-101-073	0.02 " " "
C306	Included in IFT301	
C307	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C308	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C310	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C311	1-101-073	" " " "
C312	1-103-608	200p ±5% 50V styrol
C313	1-121-353	47 $\pm^{100}_{10}$% 16V electrolytic
C314	Included in IFT 302	
C315	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C316	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C317	1-105-827-12	0.0033 ±20% 50V mylar
C318	1-105-837-12	0.022 " " "
C319	1-121-347	10 $\pm^{100}_{10}$% 16V electrolytic
C320	1-101-072	0.01 $\pm^{80}_{20}$% 25V ceramic
C321	1-101-073	0.02 " " "
C322	1-121-391	1 $\pm^{150}_{10}$% 50V electrolytic
C323	1-121-391	" " " "
C324	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C325	1-105-829-12	0.0047 ±20% 50V mylar
C326	1-121-353	47 $\pm^{100}_{10}$% 16V electrolytic
C327	1-103-617	470p ±5% 50V styrol
C328	1-101-871	30p " " ceramic
C329	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C330	1-101-073	" " " "
C331	1-101-073	" " " "
C332	1-121-356	100 $\pm^{100}_{10}$% 3.15V electrolytic
C335	1-121-391	1 $\pm^{150}_{10}$% 50V electrolytic
C336	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C401	1-105-683-12	0.068 ±10% 50V mylar
C402	1-121-291	100 $\pm^{100}_{10}$% 6.3V electrolytic
C403	Included in MU401	
C404	1-103-608	200p ±5% 50V styrol
C406	1-121-286	33 $\pm^{100}_{10}$% 16V electrolytic
C407	1-105-669-12	0.0047 ±10% 50V mylar

Ref. No.	Part No.	Description
C408	1-121-344	3.3 $\pm^{150}_{10}$% 25V electrolytic
C409	1-127-021	0.3 ±20% 10V electrolytic (aluminum)
C410	1-121-322	47 $\pm^{100}_{10}$% 6.3V electrolytic
C411	1-121-286	33 $\pm^{100}_{10}$% 16V "
C412	1-127-022	0.5 ±20% 10V electrolytic (aluminum)
C413	1-105-575	4700p ±5% 50V styrol
C414	1-105-677-12	0.022 ±10% 50V mylar
C415	1-105-677-12	" " " "
C416	1-105-671-12	0.0068 " "
C417	1-105-671-12	" " " "
C418	1-121-343	1 $\pm^{150}_{10}$% " electrolytic
C419	1-121-343	" " " "
C420	1-105-673-12	0.01 ±10% 50V mylar
C421	1-105-673-12	" " " "
C422	1-121-281	4.7 $\pm^{100}_{10}$% 25V electrolytic
C423	1-121-356	100 " 16V "
C424	Included in MU 401	
C425	1-105-665-12	0.0022 ±10% 50V mylar
C426	1-105-667-12	0.0033 " " "
C427	1-105-665-12	0.0022 " " "
C428	1-105-667-12	0.0033 " " "
C501(C551)	1-121-343	1 $\pm^{150}_{10}$% 50V electrolytic
C502(C552)	1-101-881	47p ±10% " ceramic
C503(C553)	1-121-287	47 $\pm^{100}_{10}$% 3.15V electrolytic
C504(C554)	1-121-344	3.3 $\pm^{150}_{10}$% 50V "
C555	1-121-291	100 $\pm^{100}_{10}$% 6.3V "
C601	1-121-415	100 $\pm^{100}_{10}$% 16V electrolytic
C602	1-121-297	220 " 25V "
C603	1-121-361	470 " 35V "
C604	1-105-679-12	0.033 ±10% 50V mylar
C605	1-105-679-12	" " " "
C606	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
C701	1-101-073	0.02 $\pm^{80}_{20}$% 25V ceramic
CV101 CV102 CV103 CV104 CV301 CV302	1-551-191-13S	capacitor, tuning

Resistors

All resistance values are in ohms, ±5% 1/4watts, carbon type unless otherwise indicated.

Ref. No.	Part No.	Description
R101	1-244-665	470
R102	1-244-689	4.7 K
R103	1-244-697	10K
R104	1-244-666	510
R105	1-244-673	1K
R106	1-244-685	3.3K
R107	1-244-675	1.5 K
R108	1-244-666	510
R109	1-244-692	6.2K
R110	1-244-697	10K
R111	1-244-721	100K
R112	1-244-745	1M
R113	1-244-642	51
R114	1-244-675	1.5K
R201	1-244-671	820
R202	1-244-677	1.5K
R203	1-244-685	3.3K
R204	1-244-653	150
R205	1-244-673	1K
R206	1-244-673	1K
R207	1-244-671	820
R208	1-244-677	1.5 K
R209	1-244-685	3.3 K
R210	1-244-653	150
R211	1-244-673	1 K
R212	1-244-673	1K
R213	1-244-649	100
R214	1-244-657	220
R215	1-244-721	100K
R216	1-244-671	820
R217	1-244-689	4.7K
R218	1-244-675	1.2K
R219	1-244-653	150
R220	1-244-663	390
R221	1-244-677	1.5K
R222	1-244-679	1.8K
R223	1-244-671	820
R224	1-244-673	1K
R225	1-244-649	100
R226	1-244-666	510
R227	1-244-721	100K
R228	1-244-659	270
R229	1-244-705	22K
R230	1-244-695	8.2K
R231	1-244-673	1K
R232	1-244-721	100K
R233	1-244-649	100
R234	1-244-665	470
R235	1-244-709	33K
R236	1-244-697	10K
R237	1-244-673	1K
R238	1-244-673	1K
R239	1-244-673	1K
R240	1-244-649	100
R241	1-244-743	820K
R242	1-244-719	82K
R243	1-244-691	5.6K
R244	1-244-691	5.6K
R245	1-244-673	1K
R246	1-244-673	1K
R247	1-244-699	12K
R248	1-244-745	1M
R249	1-244-734	360K
R250	1-244-745	1M
R251	1-244-723	120K
R252	1-244-735	390K
R253	1-244-745	1M
R254	1-244-642	51
R255	1-244-642	51
R256	1-244-685	3.3K
R257	1-244-657	220
R258	1-244-703	18K
R259	1-244-699	12K
R260	1-244-706	24K
R261	1-244-699	12K
R262	1-244-642	51
R263	1-244-670	750
R264	1-244-699	12K
R265	1-244-720	91K
R266	1-244-694	7.5K
R267	1-244-733	330K
R268	1-244-701	15K
R269	1-244-694	7.5K
R270	1-244-666	510
R271	1-244-667	560
R272	1-244-689	4.7K
R273	1-244-697	10K
R301	1-244-699	12K
R302	1-244-705	22K
R303	1-244-685	3.3K
R304	1-244-673	1K

Ref. No.	*Part No.*	*Description*
R305	1-244-663	390
R306	1-244-697	10K
R307	1-244-689	4.7K
R308	1-244-673	1K
R309	1-244-677	1.5K
R310	1-244-707	27K
R311	1-244-691	5.6K
R312	1-244-684	3K
R313	1-244-673	1K
R315	1-244-671	820
R316	1-244-684	3K
R317	1-244-703	18K
R318	1-244-691	5.6K
R319	1-244-665	470
R320	1-244-679	1.8K
R321	1-244-666	510
R322	1-244-694	7.5K
R323	1-244-673	1K
R324	1-244-697	10K
R325	1-244-697	10K
R326	1-244-692	6.2K
R327	1-244-717	68K
R328	1-244-701	15K
R329	1-244-673	1K
R330	1-244-671	820
R331	1-244-649	100
R332	1-244-649	100
R333	1-244-643	56
R334	1-244-697	10K
R335	1-244-692	6.2K
R336	1-244-673	1K
R401	1-244-737	470K
R402	1-244-673	1K
R404	1-244-706	24K
R405	1-244-642	51
R406	1-244-689	4.7K
R407	1-244-709	33K
R408	1-244-671	820
R409	1-244-733	330K
R410	1-244-679	1.8K
R411	1-244-690	5.1K
R412	1-244-682	2.4K
R413	1-244-682	2.4K
R414	1-202-559	270 1/2W composition
R415	1-244-649	100
R416	1-244-666	510
R417	1-244-666	510
R418	1-244-679	1.8K
R419	1-244-679	1.8K
R420	1-244-683	2.7K
R421	1-244-683	2.7K
R422	1-244-683	2.7K
R423	1-244-683	2.7K
R424	1-244-673	1K
R425	1-244-673	1K
R426	1-244-697	10K
R427	1-244-697	10K
R428	1-244-734	360K
R429	1-244-723	120K
R430	1-244-733	330K
R431	1-244-701	15K
R432	1-244-697	10K
R433	1-244-703	18K
R434	1-244-745	1M
R435		56K, 62K, 82K, 100K, 120K, 160K
R501(R551)	1-244-673	1K
R502(R552)	1-244-661	330
R503(R553)	1-244-723	120K
R504(R554)	1-244-707	27K
R505(R555)	1-244-715	56K
R506(R556)	1-244-658	240
R507(R557)	1-244-683	2.7K
R508(R558)	1-244-702	16K
R509(R559)	1-244-707	27K
R510(R560)	1-244-673	1K
R561	1-244-665	470
R601	1-244-672	910
R602	1-244-672	910
R701	1-202-645	1M 1/2W composition
Rv201	1-221-966	10K (B) semi-fixed
Rv202	1-221-636	10K (B) semi-fixed
Rv501	1-222-811	5K (B) semi-fixed
Rv701	1-222-282	10K (B) variable
Rv702	1-222-282	10K (B) variable

Switches

S701	1-514-615	switch, rotary (FM-AM)
S702	1-514-250	" push (AFC)
S703	1-514-250	" " (MODE)
S704	1-514-250	" " (HI BLEND)

Ref. No.	Part No.	Description
S705	1-514-250	switch, seesaw (MUTING)
S706	1-514-599-11	" " (POWER)
	1-514-599-21	" " (POWER) (USA Model)
S707	1-514-524	switch, slide (DE-EMPHASIS CHANGEOVER)

Filters

CF201	1-403-562	filter, ceramic	10.7 MHz
CF202	1-403-562	" "	"
CF203	1-403-562	" "	"
CF204	1-403-562	" "	"
CF205	1-403-562	" "	"
CF206	1-403-562	" "	"

FM I-F CERAMIC FILTERS		
Part. No.	*Color*	*Specified Center Freq.*
1-403-562-11	red	10.70 MHz
1-403-562-21	black	10.66 MHz
1-403-562-31	white	10.74 MHz
1-403-562-41	green	10.62 MHz
1-403-562-51	yellow	10.78 MHz

Ref. No.	Part No.	Description
CF301	1-403-153-14	filter, ceramic 455 kHz
LPF 1	1-231-088	filter, low-pass

Miscellaneous

M1	1-520-085	meter, tuning
M2	1-520-086	meter, tuner input
	1-231-057	encapsulated component, 120Ω + 0.033μF
	1-507-163	phono jack 4-p
	1-517-021	socket, meter lamp
	1-518-011-04	lamp, meter 8V 0.15A
	1-518-051-12	lamp, stereo 4.5V 40mA
	1-518-070	lamp, dial 8V 0.3A
	1-533-051	holder, dial lamp
	1-534-487-22	cord, power (General Export Model)
	1-534-526-21	cord, power (USA, CANADA Model)
	1-536-179	terminal strip, 1L1 (C)
	1-536-189	terminal strip, 1L1 (B)
	1-536-226	terminal strip, 4-p
	1-539-276	printed circuit board, 3-key switch

9-919-305-00
lamp Green

SONY CORPORATION

7242

SONY®

Complete Spare Parts List

Model ST-5100

"IMPORTANT"

When ordering parts, please do not fail to furnish us the followings:

1. Part Number
2. Model Name
3. Description as mentioned in this parts list

This is due to our employment of EDPS (Electronic Data Processing System) in all the departments concerned, for procedurement, inventory control, packing, warehousing, etc. Your orders are processed mainly with the PART NUMBERS referred by you. Wrong part number, therefore, will cause wrong parts supply. To assure prompt shipment of correct parts, your cooperation will be appreciated.

NOTE:

Prices are subject to change without notice.

COMPLETE SPARE PARTS LIST FOR ST-5100

MARCH, 1970

Part No.	Description	Unit Price
	I. MECHANICAL PARTS	
X-20437-13	Bracket Ass'y, bar antenna support	$0.06
X-20437-54	Flywheel Ass'y	0.26
X-20680-04	Binding Post Ass'y, ground	0.06
X-20685-01	Chassis Ass'y	1.44
X-20685-02	Sub-chassis Ass'y	1.51
X-20685-04	Bracket Ass'y, pulley support	0.06
X-20685-05	Pointer Ass'y	0.16
X-20685-81	Panel Ass'y, front	4.72
0-029-624	Spring, tuning-capacitor drive-drum	0.01
0-051-263	Foot, rubber	0.03
2-029-953	Label, power requirement indicating (for GENERAL EXPORT Model only)	0.01
2-043-776	Retainer, front panel	0.03
2-047-106	Mask, light shield (power switch)	0.01
2-047-107	Mask, light shield (fm-am switch)	0.01
2-047-125	Clamp, lead wire	0.02
2-047-151	Band, bar antenna	0.01
2-047-241	Insulator, dial lamp	0.02
2-056-643	Cushion, front-end ass'y	0.02
2-057-730	Pulley 10 ϕ	0.01
2-066-107	Screw, top-cover securing	0.07
2-068-008	Washer, ground binding post ass'y	0.01
2-068-016	Button, push	0.01
2-068-018	Knob, fm-am selector and power switch	0.07
2-068-020	Ornamental Ring, tuning knob	0.18
2-068-031	Mask, light shield (push switch)	0.01
2-068-039	SONY Emblem	0.09
2-068-521	Panel, front	2.17
2-068-523	Panel, rear	1.04
2-068-524	Plate, bottom	0.99
2-068-525	Shield Case, front-end ass'y	0.42
2-068-526	Glass, front	0.53
2-068-527	Back Plate, dial scale	0.30
2-068-528	Dial Scale	0.37
2-068-529	Holder (A), front glass	0.05
2-068-530	Holder (B), front glass	0.05

Part No.	Description	Unit Price
2-068-531	Cushion, ornamental ring (tuning knob)	$0.01
2-068-532	Holder, dial scale	0.02
2-068-533	Bracket, flywheel support	0.13
2-068-534	Drive-drum, tuning-capacitor	0.06
2-068-536	Illuminator, stereo	0.12
2-068-537	Bracket, push switch support	0.04
2-068-538	Cushion, front glass	0.02
2-068-539	Cushion, meter holder	0.01
2-068-540	Bracket, dial-lamp holder support	0.05
2-068-541	Cover, stereo lamp	0.03
2-068-548	Nut-plate, antenna	0.02
2-068-549	Pulley 4 x 10	0.02
2-068-550	Spacer	0.01
2-068-551	Cushion, dial scale	0.02
2-068-552	Washer, tuning knob	0.01
2-068-553	Vinyl Ring, meter cushion	0.02
2-068-554	Washer-plate, power transformer	0.01
2-068-559	Name Plate	0.02
2-068-560	Holder, meter	0.06
2-068-563	Knob, tuning	0.12
2-068-566	Ornamental Panel, front	1.87
2-068-567	Shaft, tuning	0.12
3-401-179	Lug	0.01
3-409-124	Washer, nylon (tuning shaft)	0.01
3-410-032	Strain Relief, power cord	0.02
3-427-408	Retainer, lead wire	0.01
3-442-022	Grommet, stereo lamp	0.02
3-701-026	Tack Label	0.01
3-701-030	Label, serial number	0.01
3-701-402-01	Rivet	0.01
3-811-790	Speednut	0.01
3-824-046	Stopper, variable resistor	0.03
3-825-375	Washer, tuning-capacitor drive-drum	0.01
3-852-803	Shield Plate, front-end ass'y	0.03
3-852-804	Shield Cover, front-end ass'y	0.03
3-854-001	Mount, tuning-capacitor	0.05

Hardwares

7-621-259-25	Screw, machine (+) P 2.6 x 4	0.14/100
7-621-559-25	Screw, machine (+) K 2.6 x 4	0.13/100
7-621-722-45	Screw, self-tapping (+) P 3 x 6	0.25/100

Part No.	Description	Unit Price
7-621-770-37	Screw, machine (+) B 2 x 4	$0.17/100
7-623-108-16	Washer, 3 ϕ	0.38/100
7-623-110-12	Washer, 4 ϕ	0.20/100
7-623-207-11	Washer, spring 2.6 ϕ	0.05/100
7-623-408-01	Washer, lock (external) 3 ϕ	0.19/100
7-623-507-01	Lug 2.6 ϕ	0.12/100
7-623-616-00	Eyelet 2 x 3	0.06/100
7-682-148-01	Screw, machine (+) P 3 x 8	0.12/100
7-682-163-01	Screw, machine (+) P 4 x 12	0.16/100
7-682-545-03	Screw, machine (+) B 3 x 4	0.14/100
7-682-646-01	Screw, machine (+) PS 3 x 5	0.24/100
7-682-647-01	Screw, machine (+) PS 3 x 6	0.24/100
7-682-648-01	Screw, machine (+) PS 3 x 8	0.24/100
7-682-660-01	Screw, machine (+) PS 4 x 6	0.31/100
7-682-663-01	Screw, machine (+) PS 4 x 12	0.30/100
7-684-023-01	Nut 3 ϕ	0.27/100
7-684-024-01	Nut 4 ϕ	0.47/100

Ref. No.	Part No.	Description	Unit Price
		II. ELECTRICAL PARTS	
		Mounted Circuit Boards	
	98-2532-25	F-M I-F Circuit Board	$7.90
	98-2532-75	MPX Decoder Circuit Board	7.91
	98-2532-85	A-M CP/I-F Circuit Board	3.88
	98-2532-55	Power Supply Circuit Board	1.62
	98-2535-15	Front-end Ass'y, FAF-013AW	6.81
		Semiconductors	
D101		Diode, 1S351M	0.12
D102		Diode, 1T243	0.13
D201		Diode, 1S1555	0.07
D202		Diode, 1S1555	0.07
D203		Diode, 1S1555	0.07
D204		Diode, 1S1555	0.07
D205		Diode, 1S1555	0.07
D206		Diode, 1S1555	0.07
D207		Diode, 1T22A	0.05
D208		Diode, 1T22A	0.05
D209		Diode, 1T23	0.05
D210		Diode, 1T23	0.05
D211		Diode, 1T23	0.05
D212		Diode, 1T23	0.05
D301		Diode, 1T23A	0.05
D302		Diode, 1T23	0.05
D303		Diode, 1T23A	0.05
D401		Diode, 1S1555	0.07
D402		Diode, 1S1555	0.07
D403		Diode, 1S1555	0.07
D404		Diode, 1S1555	0.07
D405		Diode, 1T22A	0.05
D406		Diode, 1T22A	0.05
D407		Diode, 1T22A	0.05
D408		Diode, 1T22A	0.05
D409		Diode, 1T243	0.13

Ref. No.	Part No.	Description		Unit Price
D601		Diode,	1T243	$0.13
D602		Diode,	1T243	0.13
D603		Diode,	CD-2	0.18
Q101		FET,	2SK23	0.42
Q102		Transistor,	2SC710	0.12
Q103		Transistor,	2SC629	0.25
Q201		Transistor,	2SC403A	0.14
Q202		Transistor,	2SC710	0.12
Q203		Transistor,	2SC403A	0.14
Q204		Transistor,	2SC403A	0.14
Q205		Transistor,	2SC403A	0.14
Q206		Transistor,	2SC403A	0.14
Q207		FET,	2SK23	0.42
Q208		FET,	2SK23	0.42
Q209		Transistor,	2SC633	0.14
Q210		Transistor,	2SC633	0.14
Q301		Transistor,	2SC403A	0.14
Q302		FET,	2SK23	0.42
Q303		Transistor,	2SC403A	0.14
Q304		Transistor,	2SC403A	0.14
Q305		Transistor,	2SC403A	0.14
Q401		FET,	2SK23	0.42
Q402		Transistor,	2SC633	0.14
Q403		Transistor,	2SC634	0.14
Q404		FET,	2SK23	0.42
Q405		Transistor,	2SC633	0.14
Q501(Q551)		Transistor,	2SC631	0.17
Q502(Q552)		Transistor,	2SC633	0.14
Q601		Transistor,	2SD28	0.42

Ref. No.	Part No.	Description	Unit Price
		Transformers, Coils and Inductors	
B1	1-417-014-21	Transformer, antenna matching	$0.06
IFT101	1-403-295	IFT, fm	0.12
IFT301	1-403-152	IFT, a-m	0.11
IFT302	1-403-128	IFT, a-m	0.09
L101	1-401-351	Coil, fm antenna	0.69
L102	1-425-446	Coil, fm rf	0.10
L103	1-425-446	Coil, fm rf	0.10
L104	1-405-377	Coil, fm osc.	0.12
L201	1-407-163	Inductor, micro 33 µH	0.03
L202	1-407-184	Inductor, micro 3.3 µH	0.05
L203	1-407-408	Inductor, micro 22 mH	0.35
L301	1-407-169	Inductor, micro 100 µH	0.03
L302	1-407-178	Inductor, micro 1.0 µH	0.04
L303	1-401-370-21	Bar Antenna, a-m	0.61
L304	1-405-359	Coil, a-m osc.	0.11
L305	1-407-182	Inductor, micro 2.2 µH	0.05
L306	1-407-177	Inductor, micro 470 µH	0.03
L701	1-407-026	Inductor, micro 22 µH	0.03
MU401	1-425-548	MPX Unit	0.69
T201	1-403-291	Transformer, discriminator 10.7 MHz	0.28
T202	1-403-299	IFT, f-m 10.7 MHz	0.13
T401	1-425-260-12	Transformer, switching 38 kHz	0.33
T601	1-441-547	Transformer, power (USA, CANADA Models)	1.89
	1-441-566	Transformer, power (GENERAL EXPORT Model)	2.27
		Capacitors	
		All capacitance values are in µF, except as indicated with P, which means µµF.	
C101	1-101-862	18 P ±5 % 50 V, ceramic	0.02
C102	1-101-938	1.5 P ±10 % 500 V, ceramic	0.03
C103	1-101-862	18 P ±5 % 50 V, ceramic	0.02
C104	1-101-937	1 P ±10 % 500 V, ceramic	0.03
C105	1-101-961	12 P ±5 % 50 V, ceramic	0.02
C106	1-102-985	180 P ±5 % 50 V, ceramic	0.04
C107	1-101-072	0.01 +80 -20 % 25 V, ceramic	0.02
C108	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C109	1-101-072	0.01 +80 -20 % 25 V, ceramic	0.02
C110	1-101-072	0.01 +80 -20 % 25 V, ceramic	0.02

Ref. No.	Part No.	Description	Unit Price
C111	1-101-869	27 P ±5 % 50 V, ceramic	$0.02
C112	1-102-077	0.01 ±20 % 50 V, ceramic	0.04
C113	1-101-873	15 P ±5 % 50 V, ceramic	0.02
C114	1-101-958	8 P ±0.5 P 50 V, ceramic	0.01
C115	1-102-875	7 P ±5 % 50 V, ceramic	0.03
C116	1-101-978	10 P ±5 % 50 V, ceramic	0.02
C117	1-101-072	0.01 +80 -20 % 25 V, ceramic	0.02
C118	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C119	1-101-918	0.001 +80 -20 % 25 V, ceramic	0.02
C120	1-101-986	10 P ±5 % 50 V, ceramic	0.03
C121	1-101-957	7 P ±0.5 P 50 V, ceramic	0.02
C122	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C123	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C124	1-121-353	47 +100 -10 % 16 V, electrolytic	0.05
C125	1-105-679-12	0.033 ±10 % 50 V, mylar	0.03
C126	1-121-343	1 +150 -10 % 50 V, electrolytic	0.04
C201	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C202	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C203	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C204	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C205	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C206	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C207	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C208	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C209	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C210	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C211	1-101-919	0.002 +80 -20 % 25 V, ceramic	0.02
C212		Included in T201	
C213			
C214	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C215	1-105-689-12	0.22 ±10 % 50 V, mylar	0.09
C216	1-101-030	200 P ±5 % 50 V, ceramic	0.02
C217	1-101-030	200 P ±5 % 50 V, ceramic	0.02
C218	1-101-030	200 P ±5 % 50 V, ceramic	0.02
C219	1-121-347	10 +100 -10 % 16 V, electrolytic	0.04
C220	1-107-140	240 P ±10 % 50 V, silvered mica	0.02
C221	1-101-424	500 P ±20 % 250 V, ceramic	0.02
C222	1-127-020	0.2 ±20 % 10 V, electrolytic (aluminum)	0.06
C223	1-127-021	0.3 ±20 % 10 V, electrolytic (aluminum)	0.06
C224	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C225	1-121-347	10 +100 -10 % 16 V, electrolytic	0.04
C226	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02

Ref. No.	Part No.	Description	Unit Price
C227	1-121-287	47 +100 -10 % 3.15 V, electrolytic --------	$0.04
C228	1-101-867	24 P ±5 % 25 V, ceramic ----------	0.02
C229	1-101-872	33 P ±5 % 25 V, ceramic ----------	0.02
C230	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C231	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C232		Included in T202	
C233	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C234	1-101-904	0.005 +80 -20 % 50 V, ceramic ----------	0.02
C235	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C236	1-121-281	4.7 +100 -10 % 25 V, electrolytic ---------	0.04
C237	1-121-287	47 +100 -10 % 3.15 V, electrolytic --------	0.04
C238	1-121-356	100 +100 -10 % 16 V, electrolytic ---------	0.04
C239	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C240	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C241	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C242	1-105-683-12	0.068 ±10 % 50 V, mylar ----------	0.04
C243	1-105-837-12	0.022 ±10 % 50 V, mylar ----------	0.02
C244	1-121-391	1 +150 -10 % 50 V, electrolytic ----------	0.03
C245	1-101-961	12 P ±5 % 50 V, ceramic ----------	0.02
C246	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C247	1-121-491	100 +80 -20 % 25 V, electrolytic ----------	0.04
C301	1-101-072	0.01 +80 -20 % 25 V, ceramic ----------	0.02
C302	1-105-837-12	0.022 ±10 % 50 V, mylar ----------	0.02
C303	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C304	1-101-072	0.01 +80 -20 % 25 V, ceramic ----------	0.02
C305	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C306		Included in IFT301	
C307	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C308	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C310	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C311	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C312	1-103-608	200 P ±5 % 50 V, styrol ----------	0.03
C313	1-121-353	47 +100 -10 % 16 V, electrolytic ----------	0.05
C314		Included in IFT302	
C315	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C316	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C317	1-105-827-12	0.0033 ±20 % 50 V, mylar ----------	0.02
C318	1-105-837-12	0.022 ±20 % 50 V, mylar ----------	0.02
C319	1-121-347	10 +100 -10 % 16 V, electrolytic ----------	0.04
C320	1-101-072	0.01 +80 -20 % 25 V, ceramic ----------	0.02
C321	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C322	1-121-391	1 +150 -10 % 50 V, electrolytic ----------	0.03

Ref. No.	Part No.	Description	Unit Price
C323	1-121-391	1 +150 -10 % 50 V, electrolytic ----------	$0.03
C324	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C325	1-105-829-12	0.0047 ±20 % 50 V, mylar ----------	0.02
C326	1-121-353	47 +100 -10 % 16 V, electrolytic----------	0.05
C327	1-103-617	470 P ±5 % 50 V, styrol ----------	0.03
C328	1-101-871	30 P ±5 % 50 V, ceramic ----------	0.02
C329	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C330	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C331	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C332	1-121-356	100 +100 -10 % 3.15 V, electrolytic -------	0.04
C335	1-121-391	1 +150 -10 % 50 V, electrolytic ----------	0.03
C336	1-101-073	0.02 +80 -20 % 25 V, ceramic ----------	0.02
C401	1-105-683-12	0.068 ±10 % 50 V, mylar ----------	0.04
C402	1-121-291	100 +100 -10 % 6.3 V, electrolytic --------	0.04
C403		Included in MU401	
C404	1-103-608	200 P ±5 % 50 V, styrol ----------	0.03
C406	1-121-286	33 +100 -10 % 16 V, electrolytic ----------	0.10
C407	1-105-669-12	0.0047 ±10 % 50 V, mylar ----------	0.02
C408	1-121-344	3.3 +150 -10 % 25 V, electrolytic ---------	0.04
C409	1-127-021	0.3 ±20 % 10 V, electrolytic (aluminum) ---	0.06
C410	1-121-322	47 +100 -10 % 6.3 V, electrolytic ---------	0.04
C411	1-121-286	33 +100 -10 % 16 V, electrolytic ----------	0.10
C412	1-127-022	0.5 ±20 % 10 V, electrolytic (aluminum) ---	0.06
C413	1-105-575	4700 P ±5 % 50 V, styrol ----------	0.13
C414	1-105-677-12	0.022 ±10 % 50 V, mylar ----------	0.02
C415	1-105-677-12	0.022 ±10 % 50 V, mylar ----------	0.02
C416	1-105-671-12	0.0068 ±10 % 50 V, mylar ----------	0.02
C417	1-105-671-12	0.0068 ±10 % 50 V, mylar ----------	0.02
C418	1-121-343	1 +150 -10 % 50 V, electrolytic ----------	0.04
C419	1-121-343	1 +150 -10 % 50 V, electrolytic ----------	0.04
C420	1-105-673-12	0.01 ±10 % 50 V, mylar ----------	0.02
C421	1-105-673-12	0.01 ±10 % 50 V, mylar ----------	0.02
C422	1-121-281	4.7 +100 -10 % 25 V, electrolytic ---------	0.04
C423	1-121-356	100 +100 -10 % 16 V, electrolytic ---------	0.04
C424		Included in MU401	
C425	1-105-665-12	0.0022 ±10 % 50 V, mylar ----------	0.02
C426	1-105-667-12	0.0033 ±10 % 50 V, mylar ----------	0.02
C427	1-105-665-12	0.0022 ±10 % 50 V, mylar ----------	0.02
C428	1-105-667-12	0.0033 ±10 % 50 V, mylar ----------	0.02

Ref. No.	Part No.	Description	Unit Price
C501(C551)	1-121-343	1 +150 -10 % 50 V, electrolytic	$0.04
C502(C552)	1-101-881	47 P ±10 % 50 V, ceramic	0.02
C503(C553)	1-121-287	47 +100 -10 % 3.15 V, electrolytic	0.04
C504(C554)	1-121-344	3.3 +150 -10 % 50 V, electrolytic	0.04
C555	1-121-291	100 +100 -10 % 6.3 V, electrolytic	0.04
C601	1-121-415	100 +100 -10 % 16 V, electrolytic	0.06
C602	1-121-297	220 +100 -10 % 25 V, electrolytic	0.09
C603	1-121-361	470 +100 -10 % 35 V, electrolytic	0.18
C604	1-105-679-12	0.033 ±10 % 50 V, mylar	0.03
C605	1-105-679-12	0.033 ±10 % 50 V, mylar	0.03
C606	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
C701	1-101-073	0.02 +80 -20 % 25 V, ceramic	0.02
CV101 CV102 CV103 CV104 CV301 CV302	1-151-191-13S	Capacitor, tuning	0.83

Resistors

All resistance values are in Ω, ±5 % 1/4 Watts, carbon type unless otherwise indicated.

R101	1-244-665	470	0.02
R102	1-244-689	4.7 k	0.02
R103	1-244-697	10 k	0.02
R104	1-244-666	510	0.02
R105	1-244-673	1 k	0.02
R106	1-244-685	3.3 k	0.02
R107	1-244-675	1.5 k	0.02
R108	1-244-666	510	0.02
R109	1-244-692	6.2 k	0.02
R110	1-244-697	10 k	0.02
R111	1-244-721	100 k	0.02
R112	1-244-745	1 M	0.02
R113	1-244-642	51	0.02
R114	1-244-675	1.5 k	0.02

Ref. No.	Part No.	Description	Unit Price
R201	1-244-671	820	$0.02
R202	1-244-677	1.5 k	0.02
R203	1-244-685	3.3 k	0.02
R204	1-244-653	150	0.02
R205	1-244-673	1 k	0.02
R206	1-244-673	1 k	0.02
R207	1-244-671	820	0.02
R208	1-244-677	1.5 k	0.02
R209	1-244-685	3.3 k	0.02
R210	1-244-653	150	0.02
R211	1-244-673	1 k	0.02
R212	1-244-673	1 k	0.02
R213	1-244-649	100	0.02
R214	1-244-657	220	0.02
R215	1-244-721	100 k	0.02
R216	1-244-671	820	0.02
R217	1-244-689	4.7 k	0.02
R218	1-244-675	1.2 k	0.02
R219	1-244-653	150	0.02
R220	1-244-663	390	0.02
R221	1-244-677	1.5 k	0.02
R222	1-244-679	1.8 k	0.02
R223	1-244-671	820	0.02
R224	1-244-673	1 k	0.02
R225	1-244-649	100	0.02
R226	1-244-666	510	0.02
R227	1-244-721	100 k	0.02
R228	1-244-659	270	0.02
R229	1-244-705	22 k	0.02
R230	1-244-695	8.2 k	0.02
R231	1-244-673	1 k	0.02
R232	1-244-721	100 k	0.02
R233	1-244-649	100	0.02
R234	1-244-665	470	0.02
R235	1-244-709	33 k	0.02
R236	1-244-697	10 k	0.02
R237	1-244-673	1 k	0.02
R238	1-244-673	1 k	0.02
R239	1-244-673	1 k	0.02
R240	1-244-649	100	0.02
R241	1-244-743	820 k	0.02
R242	1-244-719	82 k	0.02
R243	1-244-691	5.6 k	0.02

Ref. No.	Part No.	Description	Unit Price
R244	1-244-691	5.6 k	$0.02
R245	1-244-673	1 k	0.02
R246	1-244-673	1 k	0.02
R247	1-244-699	12 k	0.02
R248	1-244-745	1 M	0.02
R249	1-244-734	360 k	0.02
R250	1-244-745	1 M	0.02
R251	1-244-723	120 k	0.02
R252	1-244-735	390 k	0.02
R253	1-244-745	1 M	0.02
R254	1-244-642	51	0.02
R255	1-244-642	51	0.02
R256	1-244-685	3.3 k	0.02
R257	1-244-657	220	0.02
R258	1-244-703	18 k	0.02
R259	1-244-699	12 k	0.02
R260	1-244-706	24 k	0.02
R261	1-244-699	12 k	0.02
R262	1-244-642	51	0.02
R263	1-244-670	750	0.02
R264	1-244-699	12 k	0.02
R265	1-244-720	91 k	0.02
R266	1-244-694	7.5 k	0.02
R267	1-244-733	330 k	0.02
R268	1-244-701	15 k	0.02
R269	1-244-694	7.5 k	0.02
R270	1-244-666	510	0.02
R271	1-244-667	560	0.02
R272	1-244-689	4.7 k	0.02
R273	1-244-697	10 k	0.02
R301	1-244-699	12 k	0.02
R302	1-244-705	22 k	0.02
R303	1-244-685	3.3 k	0.02
R304	1-244-673	1 k	0.02
R305	1-244-663	390	0.02
R306	1-244-697	10 k	0.02
R307	1-244-689	4.7 k	0.02
R308	1-244-673	1 k	0.02
R309	1-244-677	1.5 k	0.02
R310	1-244-707	27 k	0.02
R311	1-244-691	5.6 k	0.02
R312	1-244-684	3 k	0.02

Ref. No.	Part No.	Description	Unit Price
R313	1-244-673	1 k	$0.02
R315	1-244-671	820	0.02
R316	1-244-684	3 k	0.02
R317	1-244-703	18 k	0.02
R318	1-244-691	5.6 k	0.02
R319	1-244-665	470	0.02
R320	1-244-679	1.8 k	0.02
R321	1-244-666	510	0.02
R322	1-244-694	7.5 k	0.02
R323	1-244-673	1 k	0.02
R324	1-244-697	10 k	0.02
R325	1-244-697	10 k	0.02
R326	1-244-692	6.2 k	0.02
R327	1-244-717	68 k	0.02
R328	1-244-701	15 k	0.02
R329	1-244-673	1 k	0.02
R330	1-244-671	820	0.02
R331	1-244-649	100	0.02
R332	1-244-649	100	0.02
R333	1-244-643	56	0.02
R334	1-244-697	10 k	0.02
R335	1-244-692	6.2 k	0.02
R336	1-244-673	1 k	0.02
R401	1-244-737	470 k	0.02
R402	1-244-673	1 k	0.02
R404	1-244-706	24 k	0.02
R405	1-244-642	51	0.02
R406	1-244-689	4.7 k	0.02
R407	1-244-709	33 k	0.02
R408	1-244-671	820	0.02
R409	1-244-733	330 k	0.02
R410	1-244-679	1.8 k	0.02
R411	1-244-690	5.1 k	0.02
R412	1-244-682	2.4 k	0.02
R413	1-244-682	2.4 k	0.02
R414	1-202-559	270 1/2 W composition	0.02
R415	1-244-649	100	0.02
R416	1-244-666	510	0.02
R417	1-244-666	510	0.02
R418	1-244-679	1.8 k	0.02
R419	1-244-679	1.8 k	0.02
R420	1-244-683	2.7 k	0.02

Ref. No.	Part No.	Description	Unit Price
R421	1-244-683	2.7 k	$0.02
R422	1-244-683	2.7 k	0.02
R423	1-244-683	2.7 k	0.02
R424	1-244-673	1 k	0.02
R425	1-244-673	1 k	0.02
R426	1-244-697	10 k	0.02
R427	1-244-697	10 k	0.02
R428	1-244-734	360 k	0.02
R429	1-244-723	120 k	0.02
R430	1-244-733	330 k	0.02
R431	1-244-701	15 k	0.02
R432	1-244-697	10 k	0.02
R433	1-244-703	18 k	0.02
R434	1-244-745	1 M	0.02
R435		56 k, 62 k, 82 k, 100 k, 120 k, 160 k	0.02
R501(R551)	1-244-673	1 k	0.02
R502(R552)	1-244-661	330	0.02
R503(R553)	1-244-723	120 k	0.02
R504(R554)	1-244-707	27 k	0.02
R505(R555)	1-244-715	56 k	0.02
R506(R556)	1-244-658	240	0.02
R507(R557)	1-244-683	2.7 k	0.02
R508(R558)	1-244-702	16 k	0.02
R509(R559)	1-244-707	27 k	0.02
R510(R560)	1-244-673	1 k	0.02
R561	1-244-665	470	0.02
R601	1-244-672	910	0.02
R602	1-244-672	910	0.02
R701	1-202-645	1 M 1/2 W composition	0.02
RV201	1-221-966	10 k (B), semi-fixed	0.10
RV202	1-221-636	10 k (B), semi-fixed	0.05
RV501	1-222-811	5 k (B), semi-fixed	0.24
RV701	1-222-282	10 k (B), variable	0.14
RV702	1-222-282	10 k (B), variable	0.14

Ref. No.	Part No.	Description	Unit Price
		Switches	
S701	1-514-615	Switch, rotary (FM-AM)	$0.83
S702	1-514-250	Switch, push (AFC)	0.46
S703	1-514-250	Switch, push (MODE)	0.46
S704	1-514-250	Switch, push (HI BLEND)	0.46
S705	1-514-250	Switch, push (MUTING)	0.46
S706	1-514-599-11	Switch, seesaw (POWER)	0.47
	1-514-599-21	Switch, seesaw (POWER) (for USA Model)	0.52
S707	1-514-524	Switch, slide (DE-EMPHASIS CHANGEOVER)	0.12
		Filters	
CF201	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF202	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF203	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF204	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF205	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF206	1-403-562-92	Filter, ceramic 10.7 MHz	0.17
CF301	1-403-153-14	Filter, ceramic 455 kHz	0.19
LPF1	1-231-088	Filter, low-pass	1.27
		Miscellaneous	
M1	1-520-085	Meter, tuning	0.99
M2	1-520-086	Meter, tuner input	0.99
	1-231-057	Encapsulated Component, 120 Ω+0.033 μF	0.12
	1-507-163	Phono Jack 4-P	0.17
	1-517-021	Socket, meter lamp	0.05
	1-518-011-04	Lamp, meter 8 V / 0.15 A	0.04
	1-518-051-12	Lamp, stereo 4.5 V/ 40 mA	0.08
	1-518-070	Lamp, dial 8 V / 0.3 A	0.12
	1-533-051	Holder, dial lamp	0.04
	1-534-487-22	Cord, power (for GENERAL EXPORT Model)	0.32
	1-534-526-21	Cord, power (for USA, CANADA Models)	0.33
	1-536-179	Terminal Strip, 1L1 (C)	0.02
	1-536-189	Terminal Strip, 1L1 (B)	0.03
	1-536-226	Terminal Strip, 4-P	0.22
	1-539-276	Printed Circuit Board, 3-Key Switch	0.06

Part No.	Description	Unit Price
	III. ACCESSORIES & PACKING MATERIALS	
	Packing Materials	
X-20685-07-3	Carton Ass'y (for CANADA, GENERAL EXPORT Models) ---	$2.14
(2-068-304)	Cushion ----------	0.66
(2-068-305)	Corrugated Cardboard ----------	0.61
(2-068-512)	Carton ----------	0.85
X-20685-08	Carton Ass'y (for USA Model) ----------	3.31
(2-068-304)	Cushion ----------	0.66
(2-068-305)	Corrugated Cardboard ----------	0.61
(2-068-512)	Carton ----------	0.85
(2-068-513)	Carton, outer ----------	1.18
2-068-430	Bag, polyethylene ----------	0.12
	Accessories	
X-37930-04	Card Ass'y, warranty ----------	0.15
X-44906-02	Cloth, polishing ----------	0.02
1-501-083	Feeder Antenna ----------	0.39
1-534-049-31	Connecting Cord, RK-74 ----------	0.48
2-057-975	Bag, polyethylene ----------	0.01
3-701-020	Bag, polyethylene ----------	0.01
3-790-897-12	Manual, instruction (for CANADA, GENERAL EXPORT Models) ----------	0.35
3-790-897-31	Manual, instruction (for USA Model) ----------	0.35
3-792-768-41	Tag, price (for CANADA Model only) ----------	0.03
3-793-105	List, warranty station (for CANADA Model only) -----	0.03
3-793-107	Card, warranty (for CANADA Model only) ----------	0.04
3-793-183	Card, inspection ----------	0.01
3-811-819-03	Label, FCC (for USA Model only) ----------	0.02